Vol. 984 Number 5

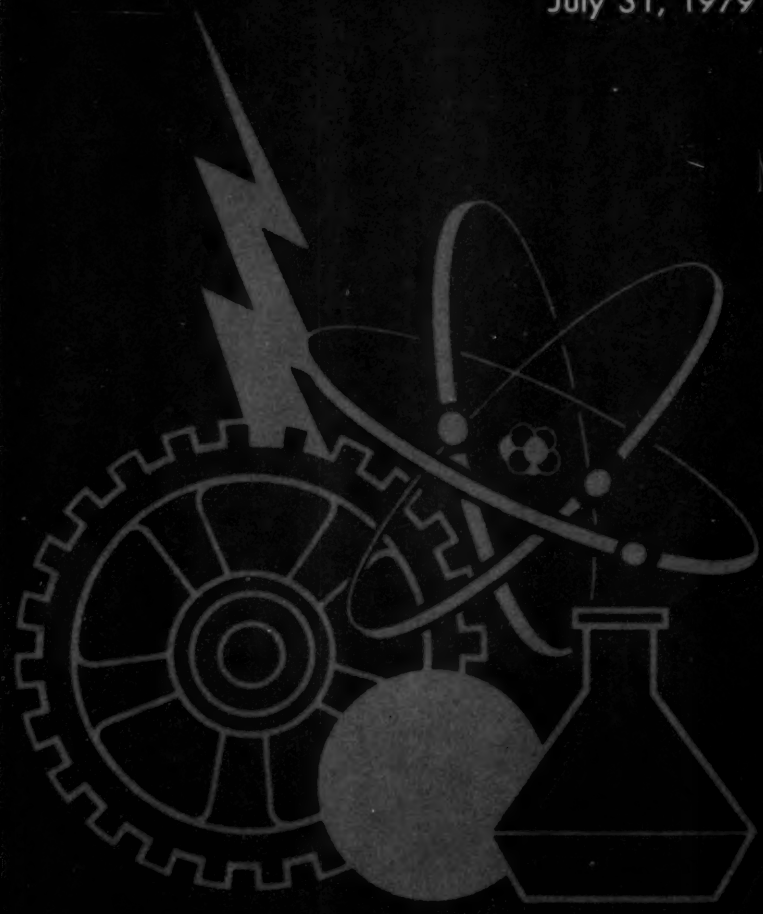
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 31, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

July 31, 1979 Volume 984 Number 5

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	984 OG 38
Reissue Applications Filed	984 OG 38
Patent Notices	
Certificates of Correction for the Week of July 31, 1979	984 OG 39
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	984 OG 40
Condition of Patent Applications	984 OG 41
Reissue Patents Granted (30,056)	1051
Plant Patents Granted (4,444)	1053
Patents Granted	
General and Mechanical (4,162,542)	1055
Chemical (4,162,892)	1173
Electrical (4,163,117)	1239
Design Patents Granted (252,476)	1299
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 26
Classification of	
Patents (Including Reissues)	PI 29
Designs and Plants	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 32
Designs and Plants	PI 33
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 235,141, Re. S.N. 038,189, Filed May 11, 1979, Cl. D13/1 A, BUILDING, Ralph J. Ramer, Owner of Record: *Hallmark Leisure Homes, Inc., Tampa, Fla.,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 290

4,020,197, Re. S.N. 017,339, Filed Mar. 5, 1979, Cl. 427/304, PROCESS FOR THE CATALYTIC SENSITIZATION OF NON-METALLIC SURFACES FOR SUBSEQUENT ELECTROLESS METALLIZATION, Horst Steffen, Owner of Record: *Kollmorgen Technologies Corporation, Dallas, Tex.,* Attorney or Agent: George B. Finnegan, et al., Ex. Gp.: 162

4,073,322, Re. S.N. 036,745, Filed May 7, 1979, Cl. 141/169, HIGH-SPEED FILLING MACHINE, Richard N. Bennett, Owner of Record: *National Instrument Company, Inc., Baltimore, Md.,* Attorney or Agent: Paul M. Craig, et al., Ex. Gp.: 243

PATENT NOTICES

Certificates of Correction for the Week of July 31, 1979

3,626,331	4,130,220	4,146,272	4,149,239
3,984,518	4,130,437	4,146,335	4,149,246
3,985,676	4,130,629	4,146,342	4,149,254
4,021,441	4,130,680	4,146,378	4,149,268
4,028,356	4,131,457	4,146,487	4,149,296
4,032,059	4,133,647	4,146,504	4,149,437
4,043,956	4,134,234	4,146,538	4,149,459
4,060,678	4,134,619	4,146,776	4,149,512
4,061,626	4,135,270	4,147,125	4,149,564
4,071,054	4,136,040	4,147,382	4,149,687
4,072,930	4,136,114	4,147,388	4,149,899
4,079,028	4,136,729	4,147,410	4,149,904
4,081,826	4,136,946	4,147,471	4,149,990
4,082,534	4,137,204	4,147,504	4,150,167
4,084,122	4,137,655	4,147,571	4,150,393
4,092,728	4,138,345	4,147,620	4,150,526
4,093,052	4,138,354	4,147,858	4,150,738
4,096,329	4,138,551	4,147,939	4,150,743
4,097,459	4,138,822	4,148,116	4,150,846
4,097,963	4,139,175	4,148,127	4,151,003
4,102,805	4,139,379	4,148,140	4,151,202
4,105,336	4,139,488	4,148,390	4,151,399
4,105,700	4,139,924	4,148,411	4,151,467
4,107,009	4,140,188	4,148,432	4,151,481
4,107,209	4,143,255	4,148,446	4,152,002
4,108,537	4,143,444	4,148,479	4,152,147
4,112,079	4,144,176	4,148,483	4,152,578
4,113,417	4,144,314	4,148,489	4,152,748
4,114,377	4,144,522	4,148,536	4,152,827
4,115,850	4,145,388	4,148,575	4,152,884
4,118,583	4,145,534	4,148,671	4,153,384
4,118,771	4,145,535	4,148,773	4,153,802
4,122,032	4,145,561	4,148,827	4,153,906
4,126,477	4,145,695	4,148,875	4,154,718
4,126,619	4,145,699	4,148,972	
4,128,367	4,146,156	4,149,001	
4,129,083	4,146,257	4,149,026	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints: Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

REISSUES

JULY 31, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

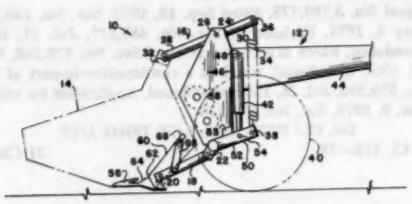
Re. 30,056
CROP HARVESTING MACHINE HEADER SUSPENSION SYSTEM

Lawrence M. Halls, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Original No. 3,959,957, dated Jun. 1, 1976, Ser. No. 544,028, Jan. 24, 1975. Application for reissue Apr. 21, 1978, Ser. No. 898,745

Int. Cl.[2] A01D *47/00*

U.S. Cl. 56—208 **17 Claims**



12. A crop harvesting machine, comprising:

a mobile frame adapted to move across a field in a forward direction;

an elongated header disposed forwardly of said frame and extending transversely to said forward direction for harvesting crop material from the field and delivering said crop material rearwardly as said mobile frame advances forwardly;

a pair of upper and lower elongated rolls generally horizontally mounted on said frame rearwardly of said header, not weight bearing upon said lower links set forth below, for receiving said harvested crop material being delivered rearwardly by said header and conditioning said crop material as it moves rearwardly into the bite defined between said rolls; and

means for suspending said header from said frame for substantially complete independent movement of said header during field operation relative to said frame and rolls, said means for suspending including a pair of spaced apart lower links respectively pivotally interconnecting corresponding lower opposite lateral end portions of said header and said frame, each one of said lower links being pivotally movable independently of the other, a pair of spaced apart upper links respectively pivotally interconnecting corresponding upper opposite lateral end portions of said header and said frame, each one of said upper links being pivotally mounted on said frame for movement independent of the other, and resilient means connected to said frame and operably supporting the lateral end portions of said header so as to counterbalance the weight of a respective one of said opposite lateral end portions of said header and thereby support said respective one lateral end portion of said header in an operating position relative to the field while at the same time enabling said respective one lateral end portion of said header to vertically move relative to the other lateral end portion thereof and floatingly follow the contour of the field as said mobile frame moves across the field.

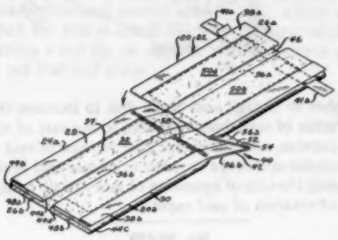
Re. 30,057
DISPOSABLE DIAPER

Charles H. Schaar, Lake Zarich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Original No. 3,943,930, dated Mar. 16, 1976, Ser. No. 511,848, Oct. 3, 1974. Application for reissue Sep. 26, 1977, Ser. No. 836,405

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **18 Claims**



24. A disposable diaper comprising:

an absorbent pad assembly having a pair of waistline portions, a crotch region intermediate the waistline portions, a fluid impervious backing sheet, a fluid pervious cover sheet, an absorbent pad intermediate the backing and cover sheets, a plurality of longitudinally extending folds defining a pleated configuration of the pad assembly having a longitudinally extending central panel, and a pair of outermost panels overlying the central panel, and lateral fold means of the pleated pad assembly is said crotch region; and

means for securing a sufficient portion of the outermost panels together in said lateral fold means to maintain the pad assembly in its laterally folded configuration responsive to longitudinal expansion of the central panel,

said lateral fold means comprising a lateral tuck in the pad assembly including a lateral fold line and first and second longitudinal sections of the pad assembly extending from the lateral fold line toward opposite waistline portions of the pad assembly, and the longitudinal length of each of the longitudinal sections being approximately ½ inch (1.27 cms.) to 2 inches (5.08 cms.).—;

Re. 30,058
SHUTTLE SPEED CONTROL DEVICE

Yukio Katahira, Sayama, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Original No. 3,992,305, dated Nov. 16, 1976, Ser. No. 625,964, Oct. 28, 1975. Application for reissue Sep. 22, 1977, Ser. No. 835,937

Claims priority, application Japan, Nov. 22, 1974, 49-134917

Int. Cl.[2] G03B *31/00*

U.S. Cl. 352—14 **3 Claims**

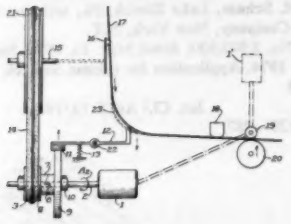
1. A shuttle speed control device for [a] sound motion picture [camera] *cameras and projectors* including a drive motor having an output shaft driving a shuttle for transporting film intermittently through an exposure station and a capstan for transporting film constantly through a sound station, and a film loop sensor arranged between the exposure station and the sound station, the control device comprising:

a first half pulley fixed to said motor output shaft;

a second half pulley coupled to said first half pulley and adjustable along said motor output shaft;

transmission means arranged about said half pulleys and coupled to said shuttle for powering said shuttle;

a brake disk rotatably supported on said output shaft;
a first pawl member arranged on said second half pulley;
a second pawl member arranged on said brake disk for engagement with said first pawl member;
a brake member on said film loop sensor movable responsive to variations in the size of the film loop whereby [an increase] *a decrease* in film loop size causes said brake



member to engage said brake disk to increase the rate of operation of said shuttle relative to the rate of rotation of said capstan, and [decrease] *an increase* of said film loop size causes said brake member to release said brake disk to decrease the rate of operation of said shuttle relative to the rate of rotation of said capstan.

Re. 30,059

ASSAY FOR MYASTHENIA GRAVIS

Jon M. Lindstrom, Del Mar, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Original No. 4,033,722, dated Jul. 5, 1977, Ser. No. 603,243, Aug. 8, 1975. Application for reissue Mar. 20, 1978, Ser. No. 888,691

Int. Cl.[2] G01N *33/16;* A61K *43/00*

U.S. Cl. 23—230.3 **8 Claims**

1. A biochemical assay system comprising a complex of acetylcholine receptor protein derived from [human] *mammalian* muscle with toxin labeled with a radioactive isotope.

Re. 30,060

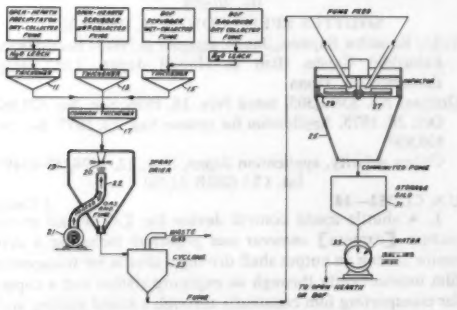
METHOD FOR AGGLOMERATING WET-COLLECTED FUME FOR USE IN METALLURGICAL FURNACES AND AGGLOMERATES PRODUCED THEREBY

John W. Kreiger, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Original No. 4,004,916, dated Jan. 25, 1977, Ser. No. 592,287, Jul. 1, 1975. Application for reissue May 5, 1978, Ser. No. 903,297

Int. Cl.[2] C22B *1/08*

U.S. Cl. 75—3 **21 Claims**



1. A method for utilizing moisture-bearing iron-containing fume from steelmaking furnaces to produce "green" balls suitable for charging into steelmaking furnaces to recover said iron, comprising:
(a) substantially instantaneously drying said fume,
(b) impact-fracturing a portion of said fume whereby the Blaine surface area of said fume is not less than about 8,000 square centimeters per gram, and
(c) balling said fume on a balling device while adding sufficient moisture to produce effective agglomeration.

Re. 30,061

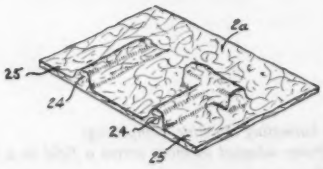
NONWOVEN FIBROUS PRODUCT AND METHOD OF MAKING THE SAME

Robert C. Shepherd, Oak Lawn, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Original No. 3,759,775, dated Sep. 18, 1973, Ser. No. 140,247, May 4, 1971. Division of Ser. No. 487,577, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 878,246, Nov. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 570,390, Jul. 26, 1966, abandoned. Application for reissue Jun. 9, 1976, Ser. No. 694,328

Int. Cl.[2] B32B *5/02, 5/18;* D04H *1/68*

U.S. Cl. 156—78 **21 Claims**



1. The method of making a stabilized low density nonwoven fabric comprising the steps of:
providing a nonwoven web of discrete fibers;
impregnating said web with an aqueous liquid, the liquid being distributed throughout the web with a minor amount of added material also being distributed throughout the web, said added material acting as a binder capable of stabilizing said fibers as an interconnected web, said added material so acting as an agent altering the surface tension of the aqueous liquid to effectively form upon heating aqueous membranes within the web of spaced and interconnected fibers;
rapidly vaporizing the volatile portions of said aqueous liquid by applying heat substantially to an internal portion of said impregnated web at a rate sufficient to cause the expanding volatile portions of said aqueous liquid to form said aqueous membranes and to exert expansive forces on said aqueous membranes between said fibers and to thereby separate portions of said web and produce a puffed web portion; and
setting the material which acts as a binder while said fibers are in the puffed condition to secure said fibers to one another at interconnections therebetween and thereby to define stable enlarged interstices between the fibers.

PLANT PATENTS

GRANTED JULY 31, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,444

DOGWOOD TREE

Glen E. Handy, Rte. 2, Box 347, Troutdale, Oreg. 97060

Filed Jul. 10, 1978, Ser. No. 923,086

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of flowering dogwood tree substantially as herein shown and described, characterized particularly as to novelty by unusually large leaves with a majority of the leaves having a dark colored margin and a light colored sharply defined central area, blooms which typically appear when the tree is extremely young, many petals of the blooms having a red tip, an upright habit of growth and brilliant dark red Fall leaf color.

PATENTS

GRANTED JUL. 31, 1979

ERRATA

For CLASS	See PATENT NO.
409–064	4,162,647
118–076	4,162,680
119–003	4,162,681
119–016	4,162,682
119–051 R	4,162,683
119–073	4,162,684
119–103	4,162,685
122–149	4,162,686
280–801	4,162,715
414–736	4,162,732
414–078	4,162,733
414–027	4,162,734
414–514	4,162,735
406–094	4,162,811
354–010	4,162,846
435–007	4,162,895
435–075	4,162,938
435–254	4,162,939
435–119	4,162,940
435–023	4,162,941
435–017	4,162,942
585–481	4,163,028
525–449	4,163,029
525–429	4,163,030
525–005	4,163,031
525–074	4,163,032
525–053	4,163,033
525–530	4,163,097

PATENTS

GRANTED JULY 31, 1979

ERRATA

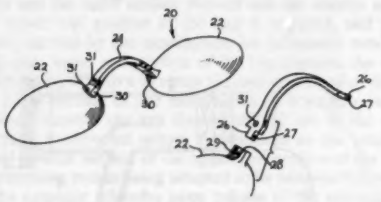
Cl.	No.
CLASS	PATENT NO
260-[illegible]	4,162,247
118-[illegible]	4,162,[illegible]
118-[illegible]	4,162,[illegible]
118-[illegible]	4,162,[illegible]
118-[illegible]	4,162,[illegible]
118-[illegible]	4,162,[illegible]
118-[illegible]	4,162,[illegible]
122-[illegible]	4,162,[illegible]
260-[illegible]	4,162,[illegible]
414-[illegible]	4,162,[illegible]
414-[illegible]	4,162,[illegible]
414-[illegible]	4,162,[illegible]
414-[illegible]	4,162,[illegible]
408-[illegible]	4,162,[illegible]
204-[illegible]	4,162,[illegible]
423-[illegible]	4,162,[illegible]
428-[illegible]	4,162,[illegible]
435-[illegible]	4,162,[illegible]
413-[illegible]	4,162,[illegible]
423-[illegible]	4,162,[illegible]
435-[illegible]	4,162,[illegible]
260-[illegible]	4,162,[illegible]
252-[illegible]	4,162,[illegible]
252-[illegible]	4,162,[illegible]
252-[illegible]	4,162,[illegible]
422-[illegible]	4,162,[illegible]
252-[illegible]	4,162,[illegible]
252-[illegible]	4,162,[illegible]

PATENTS

GRANTED JULY 31, 1979

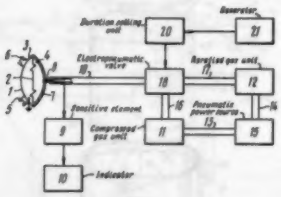
GENERAL AND MECHANICAL

4,162,542
EYE PROTECTORS
Jerome M. Frank, 10549 Valparaisa St., Los Angeles, Calif. 90034
Filed May 9, 1977, Ser. No. 795,180
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—15 **18 Claims**



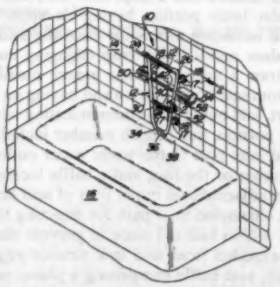
12. Improved eye protectors comprising:
a pair of substantially nontransmissive eye cups, each for fitting over one eye of a user,
each of said eye cups having an approximately elliptical shape being generally complimentary to the shape of the eye to fit against the skin above and below the eyes within the eye socket outline, each of said eye cups having a socket means on its outer surface adjacent one end thereof and
a bridge member for fitting over the nose bridge of a user, said bridge member being of substantially transparent plastic and having a substantially rectangular cross-section, said bridge member having ends shaped to releasably fit with said socket means on each of said eye cups to hold them in a substantially cooperative functional disposition.

4,162,543
ARTIFICIAL HEART
Valery I. Shumakov; Moisei A. Lokshin; Vadim V. Vlasov; Vitaly A. Burynin, and Nikolai V. Novikov, all of Moscow, U.S.S.R., assignors to Institut Transplantatsii Organov I Tkanei, U.S.S.R.
Filed Aug. 23, 1977, Ser. No. 827,029
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **9 Claims**



1. An artificial heart comprising at least one blood circulating pump having:
a housing;
a diaphragm arranged in said housing and dividing said housing into two chambers, i.e. a hydraulic chamber and a pneumatic chamber;
said hydraulic chamber having an inlet valve and an outlet valve which are adapted to be connected in the circulation of a patient;
said pneumatic chamber having a nipple for the supply and discharge of gas and a conducting transparent coating applied onto the internal wall of said pneumatic chamber so that said coating and the surface of the blood circulating in said hydraulic chamber form a capacitor whose capacity varies depending on changes in the volume of the hydraulic chamber, said capacitor serving as a blood volume transducer of the pump;
a system for controlling the supply of gas to and the discharge of gas from said pneumatic chamber of said pump, comprising:
an electric power source;
a pneumatic power source;
an element sensitive to changes in the volume of blood in said hydraulic chamber of said pump, which sensitive element is an RC bridge one of whose arms incorporates said blood volume transducer of said pump;
an indicator of the volume of blood in said hydraulic chamber of said pump, connected to said sensitive element;
a compressed gas unit having a pneumatic input and an output, said pneumatic input being connected by means of a pneumatic line to said pneumatic power source;
a rarefied gas unit having a pneumatic input and a pneumatic output, said pneumatic input being connected by means of a pneumatic line to said pneumatic power source;
an electropneumatic valve having two pneumatic inputs, an electric input and a pneumatic output, said pneumatic output being connected by means of a pneumatic line to said nipple of said pneumatic chamber of said pump, one of said pneumatic inputs being connected through a pneumatic line to said compresses gas unit, while the second pneumatic input is connected through a pneumatic line to said rarefield gas unit;
a clock pulse generator which performs the function of a pulse rate setting unit;
a unit for setting the duration of the compressed gas intake, having an electric input and an electric output, said electric input being connected to said clock pulse generator, whereas said electric output is connected to the electric input of said electropneumatic valve.

4,162,544
SAFETY RAILING
Joseph T. Freeman, Philadelphia, and Aaron Colish, Bala Cynwyd, both of Pa., assignors to Bath-Ladd Corporation, Philadelphia, Pa.
Filed Feb. 3, 1978, Ser. No. 874,720
Int. Cl.[2] A47K *3/12*
U.S. Cl. 4—185 H **10 Claims**



1. A safety railing for attachment to a wall adjacent a bathtub comprising:
a frame substantially in the configuration of an isosceles triangle with the corners of the triangle being curvilinear;
said frame being adapted to be attached spaced from and

substantially parallel to a wall with the portion of said frame forming the base of the triangle being uppermost and in a generally horizontal disposition and the portion of said frame forming the apex of the triangle contacting a portion of a bathtub;

means for attaching said frame to a wall;

means for holding soap attached to said frame; and

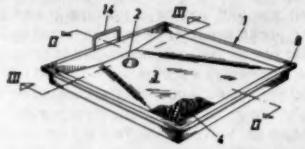
a box for storing articles during bathing attached to said frame, said box having a top contoured to shed water.

4,162,545

SINK FOR WASH-BASINS, DRAINBOWLS AND THE LIKE

Jan-Åke Hallén, Brinketorpsvägen 3, Partille, Sweden (433 00)

Continuation of Ser. No. 696,182, Jun. 15, 1976, abandoned.
This application Nov. 3, 1977, Ser. No. 848,303
Claims priority, application Sweden, Jun. 17, 1975, 7506914
Int. Cl.[2] E03C *1/26*
U.S. Cl. 4—190 **4 Claims**



1. In a sink intended to be used for wash-basins, drainbowls and the like including a trough-shaped vessel having a drainage opening located at its lowest part, a splash-guard detachable fitted at the upper part of the sink and extending over substantially the entire opening thereof, the improvement comprising said splash-guard being formed by a closed meshed lattice having thin parallel intermediate walls forming the lattice openings said intermediate walls having an extension larger than or at least equal to the largest cross-sectional measure of said lattice openings in a direction perpendicular to the plane of the upper surface of the sink and the lattice being substantially as deep as the smallest depth of the vessel.

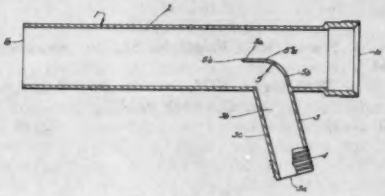
4,162,546

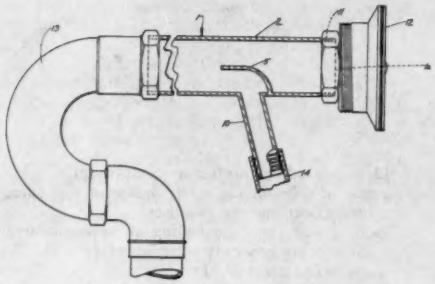
BRANCH TAIL PIECE

Kenneth R. Shortell, Cincinnati, Ohio, assignor to Carrcraft Manufacturing Company, Cincinnati, Ohio

Filed Oct. 31, 1977, Ser. No. 847,097
Int. Cl.[2] E03D *9/04*
U.S. Cl. 4—191 **11 Claims**

1. A branch tail piece for connecting the waste water outlet of an automatic dishwasher or the like to a waste drain system having a sink strainer and a trap, said tail piece comprising a hollow tubular body portion having an upper sink strainer engaging end including means for coupling said tail piece to the sink strainer and a lower trap engaging end adapted to engage the trap, a hollow tubular branch member extending outwardly from said body portion and having an inlet port and an outlet port, said outlet port communicating with the interior of said body portion, said branch member including means for coupling said inlet port to the waste water outlet of the automatic dishwasher or the like, and a baffle located within said body portion adjacent said outlet port of said branch member to provide a channeled flow path for directing the flow of the waste water within said tail piece to prevent the waste water from being expelled from said sink strainer engaging end of said tail piece, said baffle comprising a planar portion and an arcuate portion, said planar portion extending chordwise across the interior of said body portion, the lower edge of said planar portion extending at least as far as a line projected along the inner surface of said branch member such that said baffle extends at least across said branch member outlet part, said arcuate portion extending across the interior of said body portion, the lower end of said arcuate portion being attached to the upper edge of said planar portion, the upper edge of said arcuate portion being attached to the inner wall of said body portion between said outlet port and said sink strainer engaging





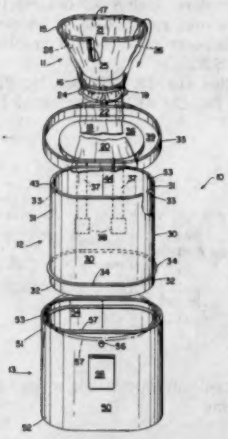
end, whereby said baffle deflects downwardly the hot waste water from the dishwasher and dissipates the heat, thus protecting the body portion of said tail piece from damage.

4,162,547

POCKET CUSPIDOR

Allen N. Jenkins, Rte. 2, West, Miss. 39192

Filed Oct. 12, 1978, Ser. No. 950,714
Int. Cl.[2] A61J *19/00*
U.S. Cl. 4—259 **29 Claims**



1. A cuspidor comprising a mouthpiece having an upper end and a lower end, the mouthpiece having an opening extending therethrough between the upper end and the lower end, a flexible waterproof bag having an upper end and a lower end and an interior surface and an exterior surface, the said bag being open at its upper end and closed at its lower end whereby spitum may be introduced into the interior thereof via the open

end and retained therein by the closed lower end in contact with the said interior surface and out of contact with the said exterior surface when the bag is in an upright position, the said upper end of the bag being passed upward through the said opening in the mouthpiece from the lower end of the mouthpiece opening to the upper end thereof, the said upper end of the bag also being passed upward through the mouthpiece opening a substantial distance past the said upper end of the mouthpiece and being opened and folded in its open condition around the opening in the said upper end of the mouthpiece and then passed downward onto the outer surface of the mouthpiece whereby the exterior surface of the upper end portion of the bag is in contact with the opening in the mouthpiece and the outer surface thereof and the interior surface of the upper end portion of the bag is exposed, and retaining means carried by the mouthpiece for releasably retaining the said open upper end portion of the bag thereon, the retaining means being effective to retain the said upper end of the bag on the outer surface of the mouthpiece at a point a substantial distance beneath the top thereof during use of the cuspidor whereby misdirected spitum is deposited on the resultant exposed interior surface of the upper end portion of the bag, and the retaining means being adapted to be released following use of the cuspidor whereby upon release of the retaining means the said upper end of the bag may be pulled downward through the mouthpiece opening and the bag removed from the mouthpiece without the interior surface of the bag touching the mouthpiece and whereby the contents of the bag may be disposed of in a sanitary manner.

4,162,548

WATER CLOSETS

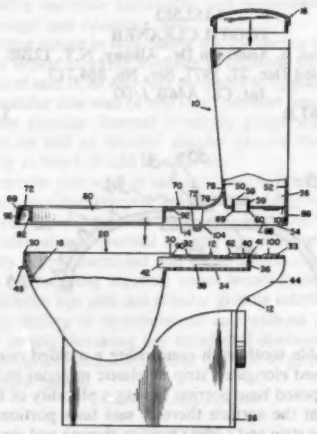
Frederick W. H. Groombridge, Welwyn, and Ronald N. Butler, Prestwood, both of England, assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,310

Claims priority, application United Kingdom, Apr. 13, 1977, 15298/77

Int. Cl.[2] E03D *1/00, 3/00, 5/00, 11/00*

U.S. Cl. 4—300 **10 Claims**



1. A water closet shell comprising:

(a) a basin component formed in one piece of molded plastics material and having an upwardly open bowl, an open waste outlet, a water inlet passage having a discharge opening into the bowl, adjacent the top thereof, and an inlet opening, and a supporting portion whereby the basin may be supported in place; and

(b) a cistern component formed in one piece of molded plastics material and having an upwardly open tank including an outlet opening adapted to be in register with said inlet opening of said water passage when the water closet is assembled, whereby said tank communicates with said water passage; and a flushing rim section including: a connecting wall extending from said tank and adapted to surmount the bowl when the water closet is assembled, and

a sleeve adapted to project downwardly from said connecting wall and into said bowl when the water closet is assembled, the sleeve then being spaced inwardly from the upper end of said bowl and from the discharge end of said water passage to define with said bowl a downwardly open flushing channel extending around the upper end of said bowl.

4,162,549

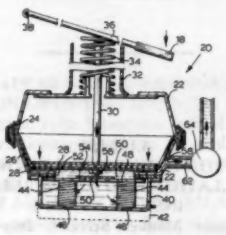
FILTERING ELEMENTS

Paul A. S. Charles, Rockford, Ill., and Frederic D. M. Williams, Mississauga, Canada, assignors to Royal Flush (1979) Inc., Hamilton, Canada

Filed Jan. 3, 1978, Ser. No. 866,629

Int. Cl.[2] E03D *5/01;* **B01D** *35/02*

U.S. Cl. 4—318 **9 Claims**



1. A filter element comprising means establishing a flow path having an inlet and an outlet, a coil spring filter element disposed in the flow path for liquid passing from the inlet to the outlet to pass through the coils thereof to be filtered, a member in the flow path movable by reverse movement of liquid in the path from the outlet toward the inlet, the movable member being mechanically connected to the coil spring filter element and compressing it axially upon said movement to reduce the flow capacity through the coils thereof during the said reverse liquid flow backwashing through the filter element.

4,162,550

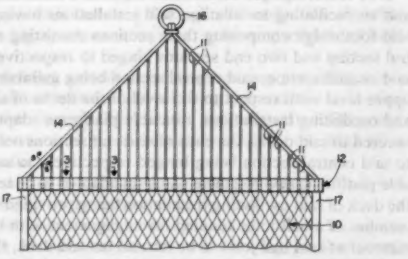
HAMMOCK

Millard L. Willingham, Anniston, Ala., assignor to Carl R. Gipson, Anniston, Ala.

Filed Feb. 16, 1978, Ser. No. 878,278

Int. Cl.[2] A45F *3/22*

U.S. Cl. 5—123 **7 Claims**



1. A hammock comprising:

(a) an elongated body supporting member formed of netted

cords with end portions of said netted cords projecting beyond each end of said body supporting member,

(b) a transverse bar adjacent each end of said body supporting member,

(c) longitudinally spaced passageways extending through each said transverse bar receiving said end portions of said netted cords with said end portions being adapted to move freely relative to said transverse bar,

(d) elongated flexible supports converging from opposite ends of each said transverse bar toward a support point located beyond the adjacent end of said body supporting member with said support point being in substantial alignment with the longitudinal center line of said body supporting member, and

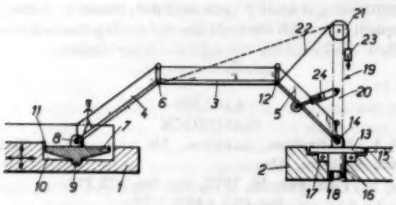
(e) means connecting said end portions of said netted cords to said elongated flexible supports at spaced intervals along said elongated flexible supports so that as a portion of said body supporting member supporting a portion of the weight of a body is moved downward it moves the end portions of the netted cords connected thereto relative to the transverse bars whereby the body supporting member automatically adjusts to the contour and weight of the body.

4,162,551

FOOTBRIDGE FOR CONNECTION BETWEEN A FIXED INSTALLATION AND AN OSCILLATING INSTALLATION

Francisco de Assis Manuel Serrano, Issy-les-Moulineaux, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines, Paris, France

Filed Mar. 27, 1978, Ser. No. 890,510
Claims priority, application France, Mar. 25, 1977, 77 09084
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—69.5 **6 Claims**



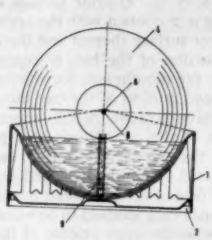
1. A footbridge for connection between a fixed installation and an oscillating installation, said installations having decks, said footbridge comprising three sections consisting of a central section and two end sections hinged to respective ends of said central section, said central section being maintained at an upper level with respect to the level of the decks of said fixed and oscillating installations, rotatable platforms adapted to be secured to said decks, the ends of said end sections not secured to said central section being hinged respectively to said rotatable platforms, said rotatable platform adapted to be secured to the deck of said oscillating installation being provided with one member of a ball joint adapted for engagement with the other member of said ball joint to be located on said deck, the upper surface of said platforms being substantially level with the upper surface of said decks, and means for compensating for the weight of said footbridge.

4,162,552

CLEANING DEVICE FOR CIRCULAR DISCS

Heinrich J. Winter, Hainburg-Hessen, Fed. Rep. of Germany, assignor to Heinrich Josef Winter Kunststoffverarbeitung unde Werkzeugbau GmbH, Hainburg am Main, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,174
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732697
Int. Cl.[2] A46B *11/00*; A47B *81/06*; G11B *3/58, 23/50*
U.S. Cl. 15—104.92 **15 Claims**



1. A cleaning device for circular discs having a central bore, said device comprising:

a cleaning tank, a cross-section of the tank being in the shape of a segment of a circle;

a base on which the tank stands;

a supporting box formed by the base providing a downwardly opening space;

two opposed side walls of the tank;

a shaft supported on the side walls to hold a disc for rotation between the side walls and

a drying rack having a base, and supporting means on which a disc may be deposited after cleaning;

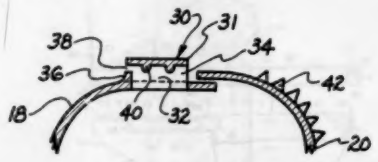
wherein the drying rack is of such a size that it can be accommodated in the space of the supporting box for storage with the supporting means flanking the tank.

4,162,553

TOOTH CLEANER

Patrick J. Bruno, 6, Anderson Dr., Albany, N.Y. 12205

Filed Dec. 27, 1977, Ser. No. 864,717
Int. Cl.[2] A46B *1/00*
U.S. Cl. 15—167 R **1 Claim**



1. A disposable toothbrush comprising a molded one piece integrally formed elongated strip of plastic material including a centrally disposed base portion having a plurality of bristles emanating from the surface thereof, said base portion being thicker than the strip and adding rigidity thereto and serving as a strong junction between the bristles and the strip for maintaining the bristles in an upstanding orientation during the cleaning operation, a first strip portion and a second strip portion extending outwardly from opposite sides of said base portion, respectively, said first strip portion including an integrally formed fastener portion forming a longitudinally extending passage including an inner wall provided with an inner wall protrusion, said second strip portion including a second integrally formed fastener portion comprising a longitudinally extending tongue provided with a plurality of longitudinally

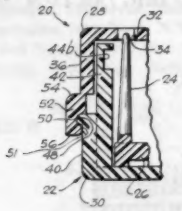
spaced upstanding tongue protrusions adapted to be forced into latched engagement with said inner wall protrusion at various positions of adjustment for securing said toothbrush to a finger of a user, wherein said longitudinally extending opening includes a restricted end aperture forming a guide for urging said upstanding tongue protrusions into latched engagement with said inner wall protrusion and an unrestricted entrance aperture that permits easy one-handed insertion of the tongue portion into and through the passage.

4,162,554

RETRACTABLE BRUSH WITH RESISTANCE TO POPPING APART

Lester R. Pellet, 6144 N. Talman Ave., Chicago, Ill. 60659

Filed Dec. 9, 1977, Ser. No. 859,029
Int. Cl.[2] A46B *9/10, 15/00, 17/06*
U.S. Cl. 15—184 **4 Claims**



2. A retractable brush, comprising

a casing made of a resilient plastic material and having generally cup shaped front and rear members which are relatively rotatable,

said front member having a front wall and an annular generally cylindrical side wall projecting rearwardly therefrom,

said front wall having a plurality of bristle receiving openings therein,

said rear member having a rear wall with an annular generally cylindrical side wall projecting forwardly therefrom,

a bristle carrying member movable in said casing and having bristles movable outwardly and retractable rearwardly through said openings, and

operating means in said casing for advancing and retracting said bristle carrying member in response to relative rotation of said front and rear members in opposite directions,

said annular side wall of said front member having a continuously circular internal inwardly projecting annular lip thereon and an internal annular groove therein immediately in front of said annular lip,

said annular side wall of said rear member having a continuously circular external annular lip projecting outwardly therefrom and slidably received in said internal groove,

said internal and external annular lips overlapping substantially when assembled and being dimensioned for assembly by snapping together under heavy manual pressure,

said annular lips and said annular groove interlocking with a snug sliding fit therebetween and without any looseness for largely obviating any accidental disconnection of said internal and external annular lips due to gripping pressure on said casing.

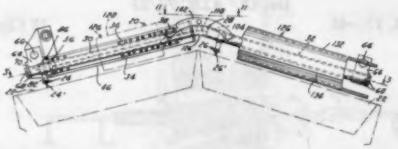
4,162,555

WIPER DRIVE ASSEMBLY

Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Company, Warren, Mich.

Filed Jul. 14, 1978, Ser. No. 924,466
Int. Cl.[2] B60S *1/46, 1/20, 1/44*
U.S. Cl. 15—250.01 **30 Claims**

1. A wiper drive assembly comprising: an elongated guide of a hollow construction having an elongated slot extending along the length thereof; a continuous drive loop of a flexible construction; a pair of sheaves over which the drive loop is trained so as to have a pair of reaches extending therebetween in a parallel relationship to the guide; a wiper support received within the guide for translatory movement along the length thereof in opposite directions; said wiper support having an extension that projects through the slot in the guide and a connection portion that extends transversely with respect to



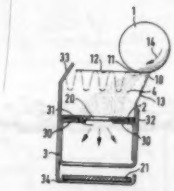
the guide slot externally of the guide; a slidable connection between the connection portion of the wiper support and the drive loop; and means for rotatively driving one of the sheaves in a single direction to thereby drive the loop and move the wiper support in a reciprocal manner through the slidable connection.

4,162,556

PROCESS AND APPARATUS FOR REMOVAL OF TRASH DEPOSITS ON OPEN-END SPINNING MACHINE

Henri van Ditshuizen; Fritz Schumann, both of Ingolstadt; Georg Goldammer, Gaimersheim, and Richard Glaser, Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 821,359
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634770
Int. Cl.[2] B08B *7/00, 5/04;* **A47L** *5/38;* **D01H** *11/00*
U.S. Cl. 15—312 R **10 Claims**



1. An apparatus for removing trash containing both coarse and fine particles from an open-end spinning machine after said trash has been separated from fibrous material and deposited in said collection chamber, said collection chamber being positioned below a releasing roll forming part of said open-end spinning machine, said apparatus comprising:

a conveyor belt traveling through said collection chamber removing predominently the coarser particles of said trash;

means defining a trash separating opening providing communication between said releasing roll and said collection chamber through which said trash separated from said fibrous material passes into said collection chamber after separation,

a fiber air stream flowing through said trash separating opening to said spinning machine, and

means for successively moving a stream of air along the length of said chamber for withdrawing predominantly the smaller particles of said trash from said collection chamber without adversely affecting said spinning operation.

4,162,557

PROCESS FOR TURNING A COATED CASING INSIDE OUT

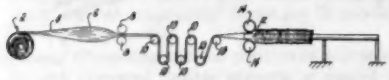
Jerome J. M. Rasmussen, Burbank, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,817

The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.

Int. Cl.[2] A22C *13/02*

U.S. Cl. 17—45 **18 Claims**



1. A process for turning an elongated flexible tubing inside out which comprises:

(a) humdifying a length of flexible tubing to at least 8 percent moisture level based on the total weight of the tubing;

(b) shirring the humid length of flexible tubing to form a shirred stick;

(c) deshirring and everting the flexible tubing of the shirred stick by drawing one end of the tubing through the bore of the shirred stick and out through the opposite end;

(d) inflating the everted deshirred tubing as it is exiting from the stick bore; and

(e) flattening the everted, inflated tubing.

4,162,558

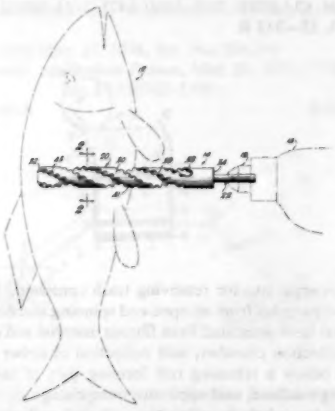
FISH SCALER TOOL

Carlos R. Rubio, 650 NW. 59 Ave., Miami, Fla. 33126

Filed May 30, 1978, Ser. No. 910,374

Int. Cl.[2] A22C *25/02*

U.S. Cl. 17—67 **1 Claim**



1. A fish scaler tool for use with a motor driven drill having a chuck means, said fish scaler comprising:

a generally elongate cylindrical member of stainless steel having a first end zone and a second end zone, said second end zone comprising an axially extending chuck engageable length of about 3/16 inch diameter to mate with the chuck means of the motor driven drill, said first end zone having an exterior surface and comprising a solid elongate body of about 4 inches in length and of about ½ inch in overall diameter of the exterior surface, said first end zone terminating at a beveled terminal end and having a plurality of spiral grooves in the exterior surface extending in equispaced relation between the beveled end to adjacent said first end zone, and each of said grooves defining an edge facing the beveled end along the lines of intersection of the spiral groove at the exterior surface and a plurality of radially inwardly extending recesses of generally semicircular form extending radially depthwise and toward the first end zone from said lines of intersection, said recesses being equispaced along said lines of intersection and comprising a plurality of integral tooth surfaces on said first end zone whereby, when said motor is energized and said tool is in engagement with the chuck means of a drill driven by said motor, the tool is adapted for use in rapidly scaling fish.

4,162,559

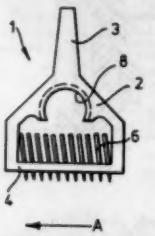
CARDING APPARATUS

David B. Stewart, Newtyle, Scotland, assignor to Wm. R. Stewart & Sons (Hacklemakers) Limited, Dundee, Scotland

Filed Oct. 6, 1977, Ser. No. 840,027

Int. Cl.[2] D01G *1508, 15/24*

U.S. Cl. 19—113 **19 Claims**



1. A carding flat comprising a rigid substrate defining an array of apertures and a plurality of individual pins each secured in a respective one of said apertures in the substrate, said substrate being an elongated member having a longitudinal axis and axially opposite hollow end portions defining hollow areas, said end portions each including an internal axially extending partially cylindrical surface opening in a direction generally transversely of said longitudinal axis into the hollow area of each hollow end portion, and axial ends of each cylindrical surface terminating at a counter bored cylindrical surface likewise opening in a direction generally transversely of the longitudinal axis into the hollow area of each hollow end portion.

4,162,560

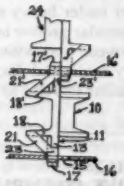
SPACER SUPPORT FOR PANEL MEMBERS

Jack W. Thomsen, LaGrange Park, Ill., assignor to Weckessar Company, Inc., Chicago, Ill.

Filed Dec. 19, 1977, Ser. No. 862,000

Int. Cl.[2] A44B *21/00, 17/00*

U.S. Cl. 24—73 P **4 Claims**



1. A spacer support assembly connectible to either side of a panel member having a circular mounting hole formed therein into which portions of cooperating assemblies are projectable so as to connect a plurality of panels in stacked spaced relation comprising:

(a) an elongated molded plastic body,

(b) said body terminating at each end solely by a pair of longitudinally extending legs,

(c) said pair legs being semi-circular in cross section and extending from one side of a longitudinal center plane that extends through the longitudinal center line of said body and adapted for projection through one-half of the mounting hole formed in the panel member,

(d) means provided by said legs for embracing a wall portion of the panel member defining the mounting hole formed therein, and

(e) means carried by said body adjacent to both ends thereof and inwardly of said legs and yieldably engaging an opposite wall portion of the panel member defining the mounting hole and cooperating with said means provided by said legs for detachably mounting said spacer support assembly to the panel member.

4,162,561

STRAIN-RELIEF DEVICE FOR A CABLE

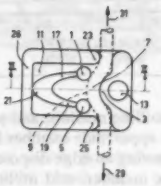
Jacobus H. Tillemans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 852,069

Claims priority, application Netherlands, Jan. 5, 1977, 7700045

Int. Cl.² F16G *11/03*

U.S. Cl. 24—129 R **2 Claims**



1. A strain-relief device for a cable, having a clamping space bounded by three clamping members for engaging a cable portion, the first and third members bearing on one side of the cable near the respective ends of the portion while the second member bears against the other side near the middle of said portion, said members being so disposed relative each other that said portion is curved, in the clamping space; and having a frame to which said clamping members are connected,

wherein said frame has surfaces engaging the cable at locations spaced from said curved portion, said surfaces defining a longitudinal direction of the cable; said frame and said members are parts of a unitary body; and said first and third members respectively are formed by the ends of two arms arranged to be movable resiliently and substantially parallel to said longitudinal direction, while the second member is stationary relative to the frame.

4,162,562

LOOM FOR HIGH WARP TAPESTRY

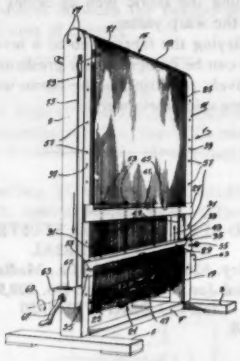
Andree Beauregard, 477, Saint-François-Xavier, Bureau 204, Montreal, Quebec, Canada

Filed Mar. 23, 1978, Ser. No. 889,482

Int. Cl.² D03D *29/00*

U.S. Cl. 28—151 **13 Claims**

1. In a loom for high warp tapestry which is made of a substantially rectangular frame mounted on a base, and wherein said frame is adapted to receive a warp in downwardly displaceable fashion along its length, the improvement wherein said frame is made of two substantially parallel upright vertical members, an upper guide bar and a lower guide bar, said upper guide bar and said lower guide bar having means to permit sliding of said warp along said upper and lower guide bars, a pair of transverse horizontal elongated holding members which are adapted to slide along said upright vertical members at the rear of the frame in parallel fashion to one another, hooking means on said elongated holding members to separately hook and retain the ends of said warp, means for drawing said holding members closer to one another to increase the rigidity on said warp, and means for fixedly



mounting one of said holding members relative to said upright members.

4,162,563

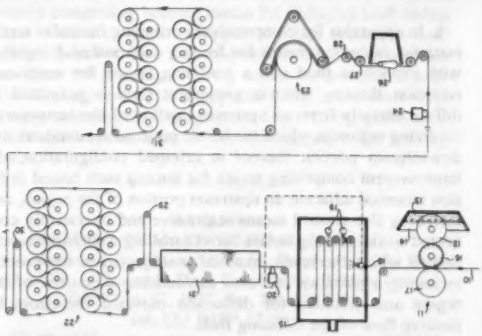
INTEGRATED METHOD OF FINISHING, STRAIGHTENING AND COMPRESSIVE PRESHRINKING OF FABRIC

Jackson Lawrence, West Sand Lake, and Robert S. Cramer, Burnt Hills, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Nov. 28, 1977, Ser. No. 855,123

Int. Cl.² D06C *21/00, 29/00*

U.S. Cl. 28—163 **5 Claims**



1. An integrated method of finishing, straightening and compressive preshrinking of a fabric web comprising the steps of:

(a) applying finishing additives and moisture by passing said fabric web through a three-roll coating unit containing said additives in a water base, the amount of moisture applied being in the range of 15% to 30% by weight;

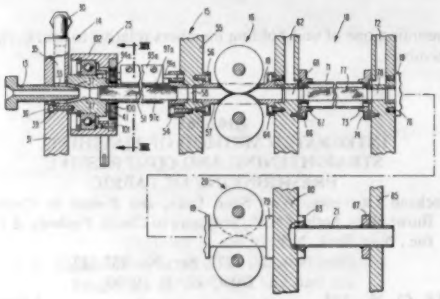
(b) applying a water spray to said fabric web, the additional moisture applied being in the range of 0% to 20% by weight of fabric web;

(c) subjecting said fabric web to steam to cause said fabric web to relax to cause penetration and dispersion of the previously applied moisture and of the finishing additives and to additionally moisten said fabric web, the additional moisture applied being in the range of 0% to 15% by weight of fabric web;

(d) sensing the amount of moisture in the fabric web and adjusting the amount of water spray applied to obtain precisely a predetermined optimum moisture level in said

fabric web in order to efficiently process the fabric web during straightening;
(e) straightening the fabric web to orient the filler yarns relative to the warp yarns;
(f) partially drying the fabric web to a level wherein said fabric web can be compressively preshrunk;
(g) compressively preshrinking the fabric web; and
(h) fully drying said fabric web.

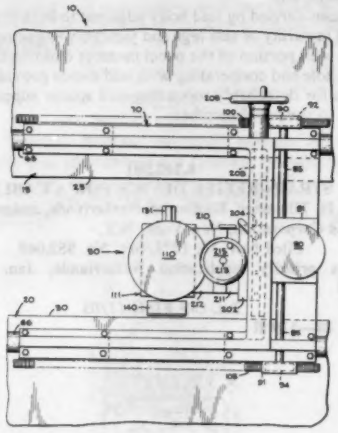
4,162,564
METHOD AND APPARATUS FOR STUFFER CRIMPING STRAND MATERIAL
Robert K. Stanley, 620 Meadowvale La., Media, Pa. 19063
Filed Jun. 27, 1977, Ser. No. 809,992
Int. Cl.[2] D02G 1/12, 1/20
U.S. Cl. 28—248 **7 Claims**



1. In apparatus for compressively crimping funicular textile material, including means for feeding such material together with propellant fluid into a confining region for temporary retention therein, wherein propellant fluid is permitted to diffuse laterally from an upstream portion of the temporarily confining region in which the textile material accumulates in a downstream portion thereof in crimped configuration, the improvement comprising means for sensing such lateral diffusion mounted adjacent an upstream portion of the region, and including also control means responsive and operatively connected to the sensing means for controlling a physical condition to which the textile material is subjected in the process including a plurality of vanes surrounding a portion of the region and mounted for deflection outward therefrom by positive flow of the diffusing fluid.

7. In compressive crimping of funicular textile material propelled lengthwise and accompanied by flow of propellant fluid into a first laterally confined region, wherein propelled textile material accumulates temporarily as a compressed mass in a downstream portion of the region, and at least some such fluid diffuses laterally from a lengthwise portion of the region unoccupied by the compressed mass, the improvement comprising utilizing positive lateral diffusion of such fluid to control the accumulation of compressed textile material in the region by controlling the temperature of the fluid with which the textile material comes into contact, including the steps of taking up the textile material from the leading edge of the compressed mass thereof in the region, confining the textile material temporarily in a successive region for fluid treatment therein, injecting treating fluid into the latter region, and adjusting the temperature of such treating fluid to heat-treat the textile material to a greater extent the further it tended to accumulate in the first region and to heat-treat the textile material to a lesser extent the less it tended to accumulate in the first region.

4,162,565
PRESS BRAKE MILLING MACHINE
Jon A. Rubenzer, 5468 Glennan Ct., San Jose, Calif. 95129
Filed Mar. 27, 1978, Ser. No. 890,070
Int. Cl.[2] B23C 7/00; B23Q 11/00
U.S. Cl. 29—33 R **11 Claims**



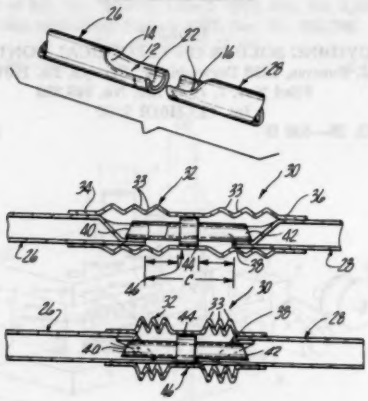
1. A combination milling machine and press brake, said press brake comprising an upper slide member having an edge and a lower bed member having an edge disposed in parallel relation with said upper slide member, said milling machine comprising:
(a) an upper way attached to said upper slide member;
(b) a lower way attached to said lower bed member in parallel relation with said upper way;
(c) a carriage engaging said upper way and said lower way to be moved therealong;
(d) means on said carriage for advancing said carriage along said upper way and said lower way; and
(e) a cutter mounted on said carriage for movement therewith and disposed in engagement with an edge of said press brake for milling the edge in engagement therewith.

4,162,566
METHOD AND COUPLING FOR SEVERING AND REJOINING SEALED TUBING
William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Dec. 12, 1977, Ser. No. 859,770
Int. Cl.[2] B23P 15/00; F16L 35/00
U.S. Cl. 29—157 R **15 Claims**

1. A method of severing and rejoining a fluid pressure vessel intermediate its length thereof, the method comprising the steps of:
crimping together the walls of said fluid pressure vessel at a point at which said fluid pressure vessel is to be severed;
sealing together the interior contacting surfaces of said crimped walls;
severing said fluid pressure vessel intermediate said sealed areas of said crimped walls to form crimped fluid pressure vessel ends;
placing said severed fluid pressure vessel ends within a coupling member, said coupling having a rejoinder coupling body section formed with collapsible portions to enable axial compression thereof and a pair of integral end sections, each configured to receive a respective one of said crimped ends, with said crimped ends being spaced apart within said coupling;
sealing together a respective coupling end section with a respective severed fluid pressure vessel end;

disposing within said body section, prior to assembly thereof of said respective fluid pressure vessel severed ends, a piercing tool, said piercing tool having oppositely directed penetrating ends with said piercing tool being positioned in said rejoinder coupling body section during said disposing step with each of said penetrating ends directed towards a respective fluid pressure vessel end;

moving said crimped fluid pressure vessel ends axially



towards each other to advance each of said piercing tool penetrating ends towards a respective crimped fluid pressure vessel end to cause penetration of each of said crimped fluid pressure vessel ends;

establishing fluid communication through said penetrated crimped fluid pressure vessel ends and said interior of said rejoinder coupling body section to thereby reestablish fluid communication between said fluid pressure vessel ends.

4,162,567

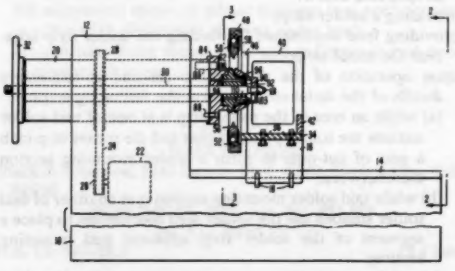
METHOD FOR MAKING A SHEET METAL PULLEY

Robert P. Guetzlaff, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 657,154, Feb. 11, 1976, Pat. No. 4,083,215. This application Dec. 20, 1977, Ser. No. 862,571

Int. Cl.[2] B21H *1/04*; B21D *22/16*

U.S. Cl. 29—159 R **4 Claims**



1. A method of making a sheet metal pulley including the steps of:

(A) forming a pair of sheet metal pulley hubs each having a cup portion with a radially outwardly extending flange at one end and nestling the two hubs together one within the other with the radially extending flanges in side-by-side relationship; and

(B) rotating the nestled hubs about a fixed axis extending through said hubs while simultaneously urging a tapered projection on the radially inner surface of a rotatable, annular forming tool between the flanges to spread the flanges and form a V-groove with only minor relative rotary movement between the flanges and the forming tool in their area of contact.

4,162,568

APPARATUS FOR UNIVERSAL JOINT ASSEMBLY

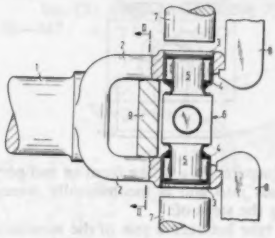
Karl Spiess, Herzogenaurach, Fed. Rep. of Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Fed. Rep. of Germany

Filed Sep. 27, 1977, Ser. No. 836,999

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645267

Int. Cl.[2] B25B *27/14*

U.S. Cl. 29—281.3 **4 Claims**



1. An apparatus for assembling universal joints formed by the connection of two shafts forked at their ends with a universal joint spider and having anti-friction bearings arranged in opposite bores in the shaft forks for accommodating the spider trunnions comprising holding means for engaging each facing portion of the fork arms to support the fork arms of a shaft forked at its end at their free end and for absorbing reaction forces from the pressing-in force, means for pressing-in anti-friction bearings arranged in opposite bores in the shaft forks and support means for engaging the inner facing portions of the fork arms at the sides of the bore opposite the holding means.

4,162,569

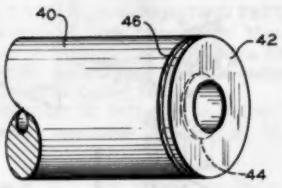
METHOD OF MAKING METAL GASKETS

John A. Damusis, Cicero, and Sam M. Rageb, Franklin Park, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 17, 1977, Ser. No. 842,723

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—417 **2 Claims**



1. A method of making flanged gasket elements including the steps of:

providing a length of metal tubing;

initially working the end portion of said tubing by the removal of a quantity of material from the peripheral side wall of said tubing to form a wall lying in a plane substantially perpendicular to the axis of said tubing and bending

the wall lying in the plane perpendicular to the axis of said tubing; and

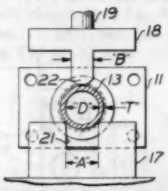
removing a predetermined length of said tubing including the end portion from said tubing.

4,162,570

METHOD AND APPARATUS FOR SEPARATING A FITTING FROM A TUBE

Jack H. Trittipoe, Elwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1978, Ser. No. 881,288
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—427 **3 Claims**



1. A method of separating a fitting from an end portion of a tube which extends into and is mechanically joined to the fitting, comprising the steps of:

positioning the tube between a pair of die members;

moving one of the die members toward the other die member and collapsing the end portion of the tube sufficiently for breaking the mechanical connection between the end portion of the tube and the fitting; and

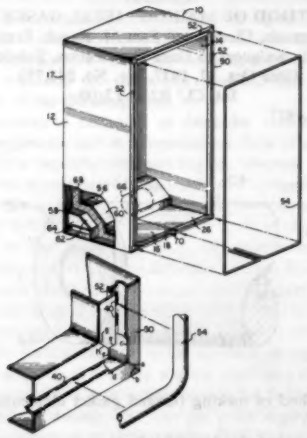
removing the fitting from the collapsed end portion of the tube.

4,162,571

METHOD OF CONSTRUCTING REFRIGERATOR CABINET

Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 749,164, Dec. 9, 1976, Pat. No. 4,114,065. This application May 5, 1978, Ser. No. 903,276
Int. Cl.[2] B23P *3/00, 19/04;* B21D *51/00*
U.S. Cl. 29—460 **9 Claims**



1. The method of forming a refrigerator cabinet which comprises:

stamping a single sheet of metal to form a plurality of first portions and a plurality of second portions and to form a section including a plurality of perforations between said first portions and said second portions;

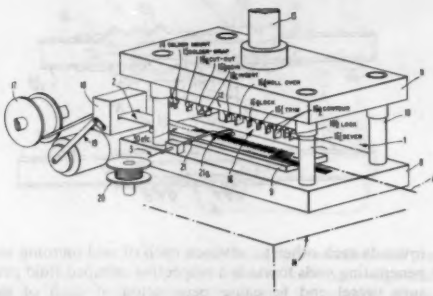
bending said sheet to cause said first portions to form the top, side and bottom outer walls of the refrigerator cabinet and to cause said second portions to form the top, side and bottom inner walls of the cabinet and to cause said perforated section to form a surface framing a door opening of the cabinet.

4,162,572

PROVIDING SOLDER ON ELECTRICAL CONTACTS

John J. Rozmus, 1030 Derwydd La., Berwyn, Pa. 19312

Filed Nov. 7, 1977, Ser. No. 848,803
Int. Cl.[2] H01R *9/00*
U.S. Cl. 29—630 D **5 Claims**



1. In a method of consecutively forming electrical contacts from at least one metal strip worked in a progressive die, which method includes providing a progressive die with its punch pad and die pad having a plurality of fabricating punch means and die means respectively spaced at fabricating stations along said axis for forming said contacts, feeder mechanism intermittently feeding the metal strip between the pads and operating said fabricating punch and die means and said feeder mechanism to consecutively form contacts, the improvement which comprises the method of providing each contact with a solder band secured thereto comprising the steps of:

providing said punch pad with a plurality of solder punch means and said die pad with a plurality of solder die means respectively spaced at solder stations along an axis and configured and movable to perform steps (a) through (d) as specified below:

providing a solder strip;

providing feed mechanism for feeding the solder strip adjacent the metal strip;

upon operation of the progressive die and at successive dwells of the metal strip perform the following steps:

(a) while an area of the metal strip is at one of said solder stations use solder punch means and die means to punch a pair of cut-outs to form a solder mounting section therebetween;

(b) while said solder mounting section is at an other of said solder stations use the solder feed mechanism to place a segment of the solder strip adjacent said mounting section;

(c) while said solder mounting section and said solder segment are maintained at said other solder station, use solder punch and die means to cut said solder segment so that portions thereof respectively extend outwardly on opposite sides of said mounting section;

(d) while said mounting section and cut solder are maintained at said other solder station use solder punch and die means to wrap said outwardly extending portions over said mounting section so the solder is self-secured thereto; and

repeat steps (a) through (d) on the body strip and solder strip

until said steps being simultaneously performed and continue said simultaneous operation to consecutively provide contacts with a solder band.

4,162,573

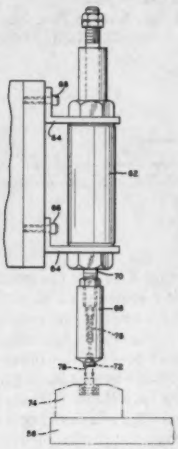
ASSEMBLY APPARATUS

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Division of Ser. No. 792,933, May 2, 1977, Pat. No. 4,100,666. This application Mar. 6, 1978, Ser. No. 883,700

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—705 5 Claims



1. Apparatus to assemble a strain indicator of the type including a tensile element and an indicator having a fixed reference and an indicator area movable with respect to said reference, said apparatus comprising:

(a) support means to retain said tensile element in a fixed position;

(b) tensile pull means to grip a portion of said tensile element and exert a tensile force thereon in order to create movement of said indicator area relative to said reference;

(c) gap measuring means to measure the distance between said reference and said indicator area with said tensile element in a state of tension;

(d) adjustment means to adjust said gap to a predetermined value with said tensile element under load;

(e) indicator fixing means to fix said indicator to said tensile member after gap adjustment.

4,162,574

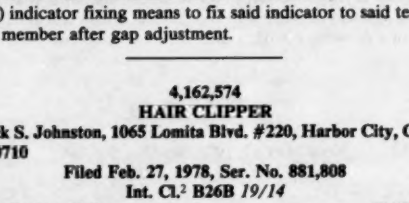
HAIR CLIPPER

Mack S. Johnston, 1065 Lomita Blvd. #220, Harbor City, Calif. 90710

Filed Feb. 27, 1978, Ser. No. 881,808

Int. Cl.[2] B26B *19/14*

U.S. Cl. 30—29.5 15 Claims



1. A cutter for cutting facial hair in the vicinity of the nostrils and ears comprising:

a body portion having a cutter end with teeth upstanding therefrom;

slot means being defined between said teeth wherein at least one of said slot means includes a slot having an open end for receiving hair therein;

a coil means rotatably carried within said body portion, said coil means having at least a portion thereof being located adjacent said slot means whereby rotation of said coil means results in cutting of said hair extending into said slot means.

4,162,575

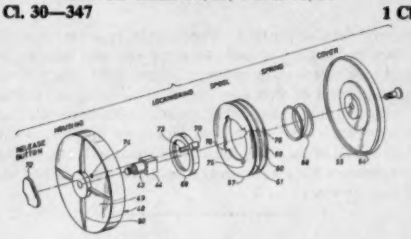
ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Continuation of Ser. No. 706,623, Jul. 19, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,931

Int. Cl.[2] A01D *55/18;* B65H *75/14*

U.S. Cl. 30—347 1 Claim



1. As a subcombination,

a spool-like member having a hollow core portion with at least three spaced apart external flange portions extending radially outwardly from the outer periphery of said core portion;

said core portion being open internally at one end thereof and with one of said external flanges being integrally joined to said core portion at said one end and terminating at the inner periphery of said one end of said core portion and at the other end having an internal flange integral with another of said external flanges and extending inwardly of the inner periphery of said core portion towards the axis of said core portion but in annular spaced relationship thereto;

said internal flange having a plurality of uniformly shaped and uniformly angularly spaced-apart recesses therein for sequentially accomodating a key member; and

a pair of flexible non-metallic line members each being wound about the outer periphery of said core portion between respective pairs of said external flanges.

4,162,576

APPLIANCES FOR TREATING TEETH

Kiyochika Takemoto, Kodaira; Yasuo Suzuki, Higashi Kurume; Yoshihito Ochiai, Fujisawa; Syozi Nakashima, Ninomiya, and Midori Hayashi, Yamakita, all of Japan, assignors to Lion Hamigaki Kabushiki Kaisha, Japan

Filed Mar. 23, 1977, Ser. No. 780,367

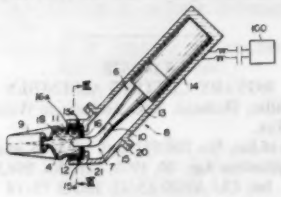
Claims priority, application Japan, Mar. 24, 1976, 51-35364[U]

Int. Cl.[2] A61C *3/00*

U.S. Cl. 32—40 R 3 Claims

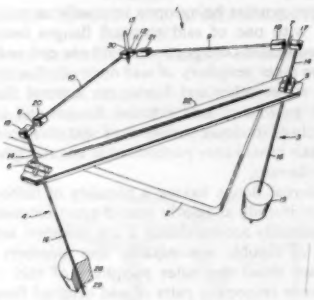
1. For use in applying to teeth a reinforcing acid-resistant layer of a tooth decay retarding agent, vibrator means for providing ultrasonic vibrations and including a vibratory tip, casing means housing said vibrator means and having a tubular open end region in the interior of which said vibratory tip is at least partly situated, and an elastic membrane wall carried by said casing means at said tubular open end region thereof and extending across said tubular open end region of said casing

means, said vibratory tip extending through said elastic membrane wall while being surrounded and fluid-tightly engaged by said membrane wall, said membrane wall maintaining its fluid-tight engagement with said tip during vibration of the latter and further including a hollow tray means for receiving teeth which are to be treated, said hollow tray means having a hollow interior containing a liquid medium for transmitting the ultrasonic vibrations, and said tray means terminating in an



elongated tubular portion adapted to be received in said tubu lar open end region of said casing means, said tubular portion of said tray means terminating in an end wall which when said tubular portion of said tray means is situated in said tubular open end region of said casing means becomes situated next to said membrane wall while said vibratory tip pierces through said end wall of said tray means to extend into and engage the liquid medium for transmitting vibrations through the latter to said tray means.

4,162,577
PENDULUM DRAWING MACHINE
Michael A. Cosman, 5175 Shalee St., Kearns, Utah 84118
Filed Oct. 31, 1977, Ser. No. 846,631
Int. Cl.[2] B43L *11/06, 9/20*
U.S. Cl. 33—27 L **16 Claims**



1. A pendulum drawing machine for making various designs on a sheet positioned on a planar horizontal surface of a base, the machine comprising:

a. Two pendulum arms having weighted ends;

b. A mounting means for pivotally mounting the pendulum arms to the base, the arms being mounted in a vertical position relative to the planar surface of the base and positioned such that the weighted ends extend below the planar surface of the base and the unweighted ends extend above the planar surface;

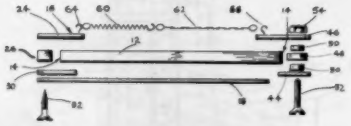
c. A pivot means for pivotally supporting the pendulum arms on the mounting means;

d. Two horizontal arms;

e. Arms attaching means for pivotally and rotationally attaching the horizontal arms to the ends of the pendulum arms extending above the planar surface of the base, the arms attaching means comprising a single, straight, nonextensible, noncompressible, resilient rod which (a) allows only limited rotation of the horizontal arms (1) about the axis of the horizontal arms, (2) about the axis of the pendulum arms, and (3) about an axis parallel to the pivot axis of the pendulum arms and which (b) prevents translational movement of the horizontal arms relative to the pendulum arms;

f. A penholder attached to the ends of the horizontal arms opposite the ends attached to the arms attaching means, the penholder holding a pen for drawing designs on a sheet.

4,162,578
T-SQUARE
Emmanuel G. Astarita, 107-2 Dune Grassway, Downsview, Ontario, Canada (M3N 3X2)
Filed Jun. 5, 1978, Ser. No. 912,294
Int. Cl.[2] B43L *13/02*
U.S. Cl. 33—443 **6 Claims**



1. A self-supporting T-square comprising:

(a) a main body consisting of an elongated straight edge member having a head at one end thereof formed with a first slipway channel extending longitudinally thereof and opening laterally toward the other end of said straight edge member, said channel having at least one longitudinally extending face thereof arranged to frictionally engage a marginal edge of a drawing board for sliding movement therealong,

(b) a carriage which does not directly engage said main body, said carriage having a second mounting channel formed therein, said second mounting channel opening towards said first slipway channel of said head and being adapted to receive a support rail for movement therealong,

(c) resilient tensioning means connecting said carriage and said main body, said resilient tensioning means being adapted to urge said carriage toward said main body,

(d) said carriage being spaced from said main body and connected thereto solely by said resilient tensioning means whereby said main body may be moved freely along said first marginal edge and is displaceable relative to said carriage in the direction of movement along the marginal edge with said resilient tensioning means serving to urge said carriage towards lateral alignment with said head when said carriage is in engagement with a marginal edge of a drawing board in use.

4,162,579
ARCHERY SIGHT
Wakelf James, P.O. Box 16, Hagar Shores, Mich. 49039
Filed May 12, 1978, Ser. No. 905,166
Int. Cl.[2] F41G *1/00;* **F41B** *5/00*
U.S. Cl. 33—265 **9 Claims**

1. An archery sighting device for fixed attachment to a bow in the vicinity of the hand grip portion thereof, said sighting device comprising:

horizontally elongated arm means having an intermediate portion for fixed connection to the bow;

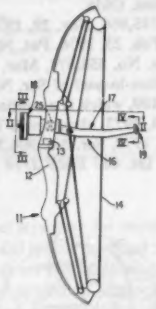
front sight means mounted on said arm means adjacent the forward end thereof so as to be positioned adjacent but forwardly of said bow;

rear sight means mounted on the rearward end of said arm means at a position disposed rearwardly of the bow string when the latter is in its nondrawn position;

said front sight means including a plurality of individual

sighting elements which are selectively individually usable in conjunction with said rear sight means depending upon the distance between the bow and the target;

said elongated arm means including front and rear elongated arm sections which individually extend substantially longitudinally of the arm means and are disposed substantially in end-to-end relationship, said front arm section being releasably secured to said bow and projecting both forwardly and rearwardly thereof, said front sight means



being mounted on the front end of said front arm section, and said rear arm section projecting rearwardly from said front arm section and having said rear sight means mounted on the rear end thereof; and

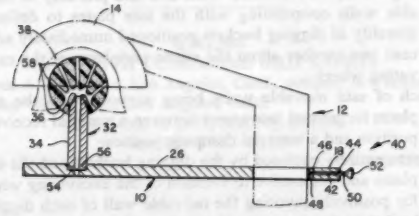
releasable connecting means for joining together the front and rear ends of said rear and front arm sections respectively, for permitting the rear arm section to be vertically angularly adjusted relative to said front arm section about a substantially horizontal adjustment axis to vertically adjust the position of said rear sight means.

4,162,580

WIG DRYING ATTACHMENT FOR HAIR DRYERS

Georgia E. Hess, 910 N. Madison St., Benton, Ill. 62812

Filed Aug. 29, 1977, Ser. No. 828,873
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—103 **4 Claims**



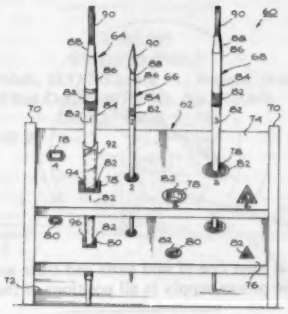
1. A wig drying attachment for hair dryers comprising a planar sheet having a substantially U-shaped portion and an elongated arm portion integral with and radiating from said U-shaped portion, said U-shaped portion adapted to engage and partially encircle a portion of said hair dryer, means for clamping said U-shaped portion about said portion of said hair dryer, means for securing a wig support to the free end of said elongated arm, said means for securing including a hollow rod, said arm having an aperture disposed adjacent the free end thereof, said rod for securement on one end thereof to said arm, said one end of said rod communicating with said aperture, a solid wig form removeably secured to the other end of said rod, said wig form having a plurality of elongated openings therethrough, said openings being in communication with the interior of said rod and in communication with the exterior surface of said wig form.

4,162,581

EDUCATIONAL TEACHING AND STORAGE SYSTEM AND METHOD

Robert F. O'Connor, 20747 Londelius, Canoga Park, Calif. 91306

Filed Apr. 20, 1977, Ser. No. 789,137
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—8 R **3 Claims**



1. An improved educational and storage teaching system, said system comprising, in combination:

a. a rack having a plurality of spaced apertures extending therethrough;

b. a plurality of art paintbrushes releasably disposed in said apertures;

c. a plurality of individual indicia or coding mechanisms associated with said rack and said brushes and relating particular ones of said brushes to particular ones of said apertures for proper placement of said brushes in said apertures;

d. wherein said apertures are of different sizes and shapes and wherein said brushes have cross-sections of complementary sizes and shapes; and,

e. wherein said brushes bear shape and size imparting sleeves.

4,162,582

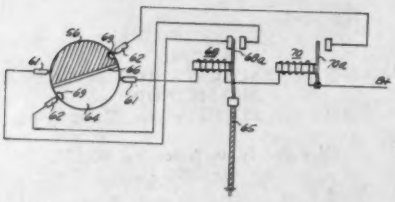
FLIGHT TRAINER AND ENTERTAINMENT DEVICE FOR SIMULATING AERIAL ACROBATICS

John T. McGraw, 528 Ashwood, Flushing, Mich. 48433, and George F. Killeen, 2421 Tandy Dr., Flint, Mich. 48507

Filed Jan. 9, 1978, Ser. No. 867,921
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 N **7 Claims**

1. In a flight trainer type aircraft having mechanism simulating that of an aircraft and including simulated airplane manual controls; a partial spherical shaped screen located forwardly relative to the aircraft where views projected thereon may be seen by the operator of the controls; a sphere located forwardly of the aircraft; support means for said sphere for permitting its rotation in three control planes; a plurality of projectors mounted inside said sphere for rotation therewith and for projecting adjacent sectorial views on said screen; and electrical drive means connected intermediate said controls and said sphere for rotating said sphere and said projectors in said planes in unison with the operation of said controls to simulate aerial acrobatics, said sphere including two electri-

cally conductive parts, means for insulating one part from the other; an electrical power supply; and means for electrically



connecting at least one of said parts and their associated projectors to the power supply in all positions of the sphere.

4,162,583

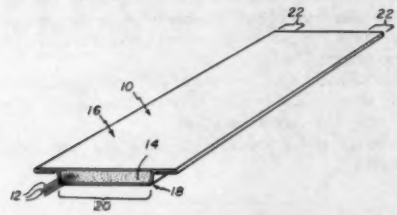
SHOE STIFFENER

John W. Darrin, Reading, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Oct. 26, 1977, Ser. No. 845,837

Int. Cl.[2] A43B *13/42*; A43D *31/00*

U.S. Cl. 36—76 R **5 Claims**



1. An article for use as a shoe reinforcement comprising:

an elongate sleeve surrounding a matrix which includes an externally activatable thermosetting resin, said resin being in a fluent form, said sleeve and resin being flexible and deformable as a unit to enable the article to be formed to the contour of a selected portion of the shoe assembly;

said sleeve being defined by first and second facing plastic strips sealed together at their lateral marginal edges to define margins by which the sleeve may be manipulated;

the material from which the second strip is formed being thermoplastic and meltable at a predetermined temperature;

the first strip being formed from a material which will substantially maintain its tensile strength at said predetermined temperature, the marginal portions of said first and second strip being heat sealed to each other;

said marginal portions defining a folded sandwich configuration in which the outermost layers of the margin are defined by the marginal portions of the first strip and wherein the inner portion of the sandwich is formed at least in part from the material of the second strip, the internal portion of the margin being fused in a substantially integral mass which is sealed to the outermost layer of the margins;

said margins of said sleeve being substantially free of curl and extending laterally in a generally flat configuration.

4,162,584

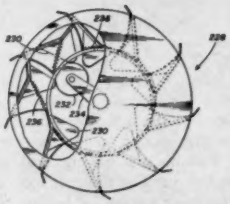
EXCAVATING WHEEL WITH CAM ASSISTED BUCKET WALL EJECTOR

Charles L. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 745,860, Nov. 29, 1976, which is a division of Ser. No. 660,515, Feb. 23, 1976, Pat. No. 4,062,562, which is a continuation of Ser. No. 554,671, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 400,043, Sep. 24, 1973, Pat. No. 3,897,109, which is a continuation-in-part of Ser. No. 238,089, Mar. 28, 1972, abandoned. This application May 10, 1978, Ser. No. 904,383

Int. Cl.[2] E02F *3/18*

U.S. Cl. 37—190 **1 Claim**



1. An excavating wheel comprising:

a pair of spaced apart side plates mounted for rotation about and each extending radially outwardly with respect to a central axis of rotation;

a plurality of stationary walls each extending between the side plates and each having outwardly projecting material cutting means;

said stationary walls being stationary with respect to the side plates;

a plurality of movable walls each extending between the side plates for cooperation with one of the stationary walls to define a digging bucket;

said plurality of stationary walls and said plurality of movable walls cooperating with the side plates to define a plurality of digging buckets positioned immediately adjacent one another about the entire periphery of the excavating wheel;

each of said movable walls being supported by the side plates for pivotal movement between a material receiving position and a material dumping position;

means entirely enclosed by the digging buckets and the side plates and responsive to rotation of the excavating wheel for positively pivoting the movable wall of each digging bucket to the material receiving position during one portion of said rotation and for positively pivoting the movable wall of each digging bucket to the material dumping position during another portion of said rotation; and

said means for positively pivoting the movable wall of each digging bucket comprising:

a spring connected to each movable wall for normally positioning the movable wall in the material receiving position;

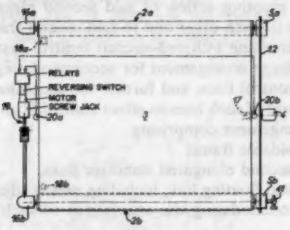
a cam mounted on each movable wall; and means fixedly supported at a point offset from the rotational axis of the excavating wheel for engagement with the cams on the movable walls to pivot each movable wall to the material dumping position against the action of the spring associated therewith.

4,162,585

DISPLAY PANEL WITH MOVABLE POSTERS

Jean-Claude Decaux, Paris, France, assignor to J. C. Decaux Paris, Publicite Abribus, Boulogne-Billancourt, France

Filed Jun. 7, 1977, Ser. No. 804,247
Claims priority, application France, Jun. 9, 1976, 76 17326
Int. Cl.[2] G09F *11/24*
U.S. Cl. 40—518 **4 Claims**



1. In a display panel structure for movable posters comprising a frame, two parallel spools mounted on the frame to rotate about their axes which are spaced apart in a first plane, a band having longitudinally extending edges and carrying posters arranged in succession on the band, the band having ends respectively connected to the spools and being, in a region of the band between the spools, substantially contained in a second plane parallel to said first plane, drive means for driving in rotation selectively one of the spools at a time so that a first of the spools is a band take up spool and a second of the spools is a band feed spool and vice-versa, and two permanently operative detecting means mounted on the frame and respectively associated with said edges for detecting transverse drift of the band in either transverse direction; the improvement comprising means for correcting the drift of the band which comprise means mounting the first spool on the frame to be inclinable in either direction relative to the second spool in said first plane and shifting means associated with and responsive to the two detecting means and connected to the first spool for inclining the first spool relative to the second spool in said first plane in a first direction when one of the detecting means detects a drift and in a second direction when the other of the detecting means detects a drift and thereby cause the band to move in a direction opposed to the drift.

4,162,586

GUN WITH CUSHIONED GRIP SAFETY

Frank A. Pachmayr, Los Angeles, Calif., assignor to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Oct. 3, 1977, Ser. No. 838,806
Int. Cl.[2] F41C *23/00*
U.S. Cl. 42—71 P **8 Claims**

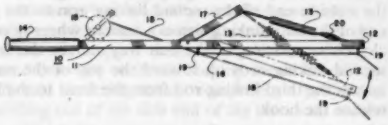
1. A gun comprising:
a handle;
a trigger at the front of said handle adapted to be actuated rearwardly;
means for firing a cartridge upon movement of the trigger; and,
a grip safety element at the rear of said handle which is mounted for slight forward movement by the hand of the user when he squeezes the handle and actuates the trigger, and which is constructed to prevent rearward cartridge firing movement of the trigger when the grip safety element is in a rear active position, but to permit such rearward movement of the trigger when the grip safety element is in a forward released position to which it is displaced by squeezing of the handle;
said grip safety element including a rigid part and a layer of softer cushioning material carried by said part at the back side thereof for engaging the user's hand and cushioning the contact therewith.

4,162,587

FISHING POLE

David H. Dethlefs, 4117 NE. 10th Pl., Renton, Wash. 98055

Filed Oct. 7, 1976, Ser. No. 730,666
Int. Cl.[2] A01K *91/00*
U.S. Cl. 43—18 R **6 Claims**



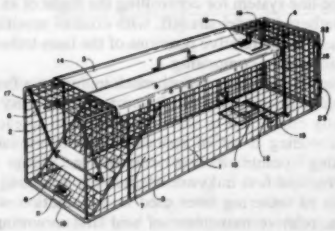
1. A fishing pole comprising:
a first rod section fabricated of a rigid material, a handle at one end thereof, said rod section carrying a reel and a ferrule;
a second rod section being fabricated of a rigid material and being hingedly mounted at one of its terminal ends to the other end of said first rod section, said second rod section having on its outer terminal end a ferrule, fishing line from said reel being strung through said ferrule on said first rod section and through said ferrule on said second rod section; and
means urging said first and second rod sections into alignment, including an outrigger issuing transversely from the other end of said first section at an obtuse angle with respect to said handle and being rigidly mounted to said first section, and a spring which is mounted between the outer end of said outrigger and the outer end protion of said second section.

4,162,588

LIVE ANIMAL TRAP

Melvin F. Wyant, Box 291, Monroe City, Ind. 47557

Filed Dec. 2, 1977, Ser. No. 856,620
Int. Cl.[2] A01M *23/02*
U.S. Cl. 43—61 **2 Claims**



1. A live animal trap for capturing and restraining a live animal, said live animal trap comprising

a cage having an open front, a closed bottom, a back, a closed top and a pair of closed sides;

a door pivotally mounted at the top of the sides in the cage at one end and having a hook at its opposite end;

a rod rotatably mounted parallel to and above the bottom in the cage near the back;

a bait tray affixed to the rod in a manner whereby said tray is rotated by an animal taking bait therefrom; and

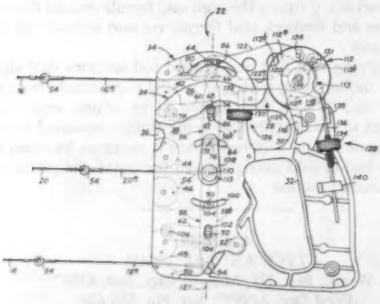
a trigger device including a plurality of linking rods coupling the bait tray to the hook of the door in a manner whereby the door is maintained in open position substantially next-adjacent the top in the cage by one of the linking rods when the bait tray is free from disturbance and said one of said linking rods is withdrawn for the hook of the door to close the door and seal the cage when the bait tray is rotated, said trigger device comprising a first linking rod affixed to the bait tray in the cage, a second linking rod coupled to the first linking rod and extending from said first linking rod through the cage and through the top of the cage to the outside thereof, a third linking rod extending along the top of the cage outside the cage and having spaced opposite first and second ends, the first end of the third linking rod cooperating with the hook of the door and a fourth angular linking arm rotatably mounted on top of the cage outside the cage and coupling the outside end of the second linking arm to the second end of the third linking arm in a manner whereby counterclockwise rotation of the bait tray moves the first and second linking rods up toward the top of the cage and moves the third linking rod from the front to the back to release the hook.

4,162,589

TETHERED MODEL AIRCRAFT CONTROL SYSTEM

Oba L. St. Clair, 15035 Larkwood Ln., Eugene, Oreg. 97405

Filed Apr. 25, 1977, Ser. No. 790,187
Int. Cl.[2] A63H *27/04*
U.S. Cl. 46—77 11 Claims



1. A three-line system for controlling the flight of an engine-powered, tethered model aircraft, with control resulting from changes made in the relative positions of the lines tethering the aircraft, said system comprising

a first control-adjustment mechanism including a first frame mountable in such an aircraft and a first plurality of links pivotally connected to said first frame and to each other and providing a set of spaced relatively movable first mounting points having connecting means thereat whereby said first links are adapted for mounting one set of ends of tethering lines used in conjunction with said system, relative movement of said first mounting points occurring solely through nonsliding, nontranslating pivoting action of said first plurality of links relative to each other and to said first frame under the influence of such lines, and

a second control-adjustment mechanism including a second frame constructed for hand-holding by an operator, and a second plurality of links pivotally connected to said second frame and to each other and providing a set of spaced relatively movable second mounting points also having connecting means thereat whereby said second links are adapted for mounting the opposite set of ends of such tethering lines, relative movement of said second mounting points occurring solely through nonsliding, nontranslating pivoting action of said second plurality of links relative to each other and to said second frame.

7. In a three-line tethered-aircraft control system, a hand-holdable linkage arrangement for accommodating attachment of ends of control lines, and further for accommodating relative movement of such lines to effect control of an aircraft, said linkage arrangement comprising

a hand-holdable frame,

first and second elongated stabilizer links,

an elongated floating link, including means adjacent its ends for accommodating the attachment of such control line ends,

first pivot means pivoting said first stabilizer link adjacent one of its ends to said frame, and second pivot means pivoting said first stabilizer link adjacent its opposite end to said floating link at a point intermediate the latter's opposite ends, and

third pivot means pivoting said second stabilizer link adjacent one of its ends to said frame, and fourth pivot means pivoting said second stabilizer link adjacent its opposite end to another point on said floating link also intermediate the latter's opposite ends,

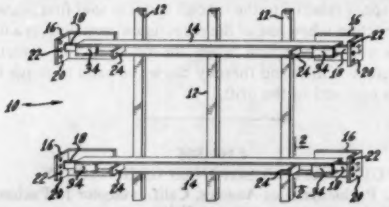
the pivot axes provided by said pivot means being substantially parallel.

4,162,590

BURGLAR BAR APPARATUS

Vernon A. Earley, 327 Woodbine St., Jacksonville, Fla. 32206

Filed Jan. 16, 1978, Ser. No. 869,951
Int. Cl.[2] E06B *3/68*
U.S. Cl. 49—55 12 Claims



1. In a rectangular burglar bar apparatus for mounting within a rectangular frame opening in a building and having a plurality of spaced bars connected to generally fit such opening, the improvement comprising a pair of extendable frame mounting means attached to one side of said apparatus and each having a frame plate, each said mounting means having an extendable member affixed to said plate to position said plate in contact with the adjacent frame element defining one side of the rectangular frame opening and to be affixed thereto, said spaced bars including a pair of elongated and parallel channel members having opposite end portions, said extendable members being respectively and slideably mounted to adjacent and respective end portions of said channel members a pair of stop means disposed on respective said adjacent end portions for limiting the extension of said extendable members, each of said stop means including elements connected to respective said adjacent end portions, each of said extendable members having a flange portion engageable with respective said element to limit the extension of said extendable member, and guard means mounted to each said plate and extending toward said

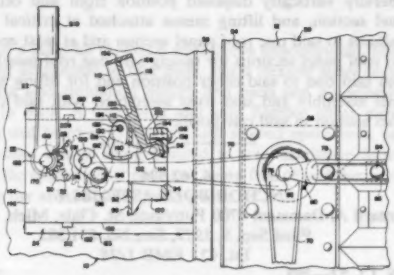
apparatus to generally overlie each of said extendable members.

4,162,591

DOOR DRIVER

Thorvald Madland, Arlington Heights, and Thomas C. Soddy, Downers Grove, both of Ill., assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Jan. 31, 1977, Ser. No. 763,853
Int. Cl.[2] E05C *3/36*; E05F *11/54*
U.S. Cl. 49—277 **1 Claim**



1. A door driver on a railway house car having a door opening for moving a door between a first and a second position comprising:

a structural member adjacent said opening;

a hat-shaped member and a reinforcing member secured to said structural member;

a lever rotatably mounted on said structural member adjacent said opening;

a plurality of drivingly interconnected drive members in addition to said lever and operatively connected thereto including a pinion fixed to rotate with said lever to drive at least one other gear member which, in turn, is operatively connected to a crank means to cause rotation thereof;

a hasp means selectively drivingly interconnected to said crank means;

said hasp means being mounted on said door for motion in both a plane parallel to the face of the door and a plane vertical to the face of the door to permit selective interconnection with said crank means;

and, means to permit said hasp means to be selectively locked in said selective interconnection with said crank means thereby to selectively maintain said door in a closed and locked condition.

4,162,592

SLIDING DOOR

Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co. Ltd., Kumamoto, Japan

Filed Jun. 1, 1977, Ser. No. 802,445
Claims priority, application Japan, Jun. 2, 1976, 51/71245[U]; Jun. 2, 1976, 51/71246[U]; Jun. 15, 1976, 51/77928[U]
Int. Cl.[2] E05F *11/00*
U.S. Cl. 49—358 **4 Claims**

1. A door adapted to be moved on a rail laid along a wall thereby to close an opening formed in the wall comprising:

a door body having a plurality of wheels and an axle for mounting each of said wheels on said body;

a first manually rotatable member having a shaft rotatably attached to one side wall of the door;

a rotary driving member of a predetermined diameter coaxially carried by said shaft;

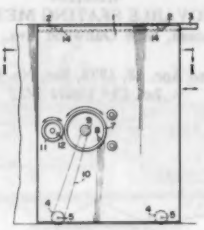
a rotary driven member carried by one of said axles and having a diameter larger than that of said driving member;

an endless power transmission member connected between said driving and driven members;

a second manually rotatable member having a first shaft rotatably attached to said one side of said door;

locking means having a second shaft operably coupled to said first shaft, wherein the rotation of said first shaft is transmitted to said second shaft, said locking means locking said door body in the closed position when said second manually rotatable member is operated; and

stopper means having detecting means partially extending out of the side end of the door and positioned for detecting



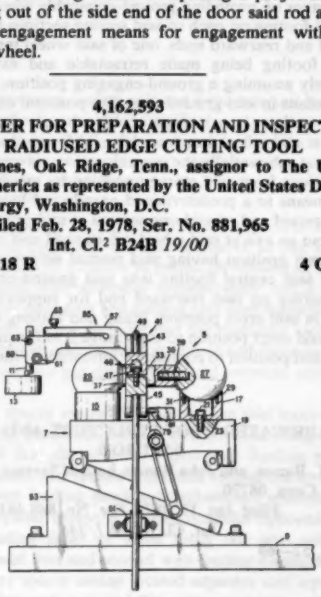
a wall contact, and engagement means for positively locking said secondary manually rotatable member in a fixed condition when said detecting means are not actuated wherein said stopper means comprises a toothed wheel formed coaxially with said locking means on said second shaft, said detecting means comprising a projecting rod extending out of the side end of the door said rod actuating said engagement means for engagement with said toothed wheel.

4,162,593

TOOL HOLDER FOR PREPARATION AND INSPECTION OF A RADIUSED EDGE CUTTING TOOL

Charles Asmanes, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 881,965
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—218 R **4 Claims**



1. A displaceable tool holding fixture, for holding a radiused edge cutting tool in a tool edge preparing apparatus, comprising:

a pair of precision formed steel balls;

a shaft rigidly connected between said pair of balls;

a pair of rigid cylindrical bearing seats each having a rim portion of the upper edge thereof beveled to receive respective ones of said pair of balls in a minimal contact seating arrangement, said bearing seats mounted on a support means of said preparing apparatus and aligned to displaceably receive said balls so that said balls are free to rotate in said seats about an axis extending through the center of both balls;

a tool holding means attached to and extending from said shaft for selectively holding said radiused edge tool aligned so that said axis of rotation of said balls is aligned with the axis about which said tool edge is generated when contacting a rotating preparing device; and

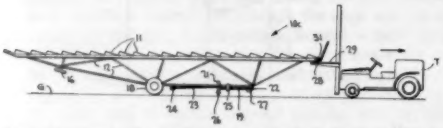
means for oscillatory rotation of the tool holding fixture through a selected arc sector coincident with the radiused edge sector of said tool.

4,162,594

MOVABLE SEATING METHOD

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed Apr. 18, 1978, Ser. No. 897,546
Int. Cl.[2] E04H *3/12*
U.S. Cl. 52—9 **28 Claims**



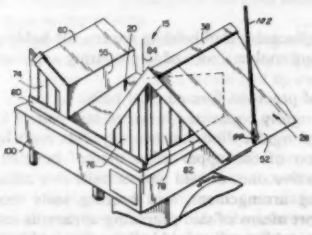
1. A method of setting up and taking down a grandstand formed of a plurality of portable grandstand seating sections having a normal seating arrangement sloping upwardly and rearwardly from forward to rearward ends thereof, comprising the steps of: providing ground-engagable wheel means and a central footing on each of said seating sections between said forward and rearward ends, one of said wheel means and said central footing being made retractable and extendable for alternately assuming a ground-engaging position; placing said wheel means in said ground-engaging position; disposing each of said sections in a storage position by pivoting said each section at said wheel means so that said forward and rearward ends are at substantially the same elevation; transporting one of said sections from said storage position by moving it on said wheel means to a predetermined grandstand location; raising said rearward end of said one section at said grandstand location about an axis at said wheel means until said one section is in an erect position having said normal setting arrangement; moving said central footing into said ground-engaging position; shoring up said rearward end for supporting said one section in said erect position; lifting and shifting said one section in said erect position so as to move it into a predetermined grandstand position to commence formation of the grandstand.

4,162,595

PREFABRICATED ROOF STRUCTURE AND ERECTION METHOD

Mario L. Ramos, and John Ramos, both of Terrace Ave., Naugatuck, Conn. 06770

Filed Jan. 11, 1978, Ser. No. 868,481
Int. Cl.[2] F04B *1/346*
U.S. Cl. 52—69 **30 Claims**



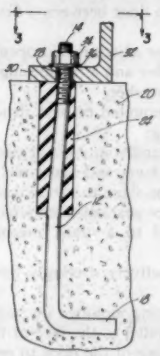
1. A roof structure comprising a truss assembly including a plurality of horizontally extending truss beams and a plurality of braces extending between and connecting said truss beams in laterally spaced parallel relation, a horizontally elongated roof panel assembly supported on said truss assembly and having a plurality of roof panel sections including an inclined roof panel section supported in a fixed upwardly inclined position on said truss assembly, one of said roof panel sections being connected to the upper end of another said roof panel section to pivot relative thereto about a horizontal axis between one position wherein said one panel section extends laterally outwardly from said other roof panel section and another position wherein said one panel section depends in a generally vertically disposed position from said other roof panel section, and lifting means attached at critical balance positions to said one roof panel section and at least another of said roof panel sections for raising said one roof panel section from said one to said other position and for lifting said roof panel assembly and said truss assembled with said one roof panel section in said one position.

4,162,596

ANCHOR BOLT ASSEMBLY

Bernard A. Damman, 6700 Puttygutt, St. Clair, Mich. 48079

Filed Sep. 8, 1977, Ser. No. 831,383
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—295 **3 Claims**



1. An anchor bolt assembly comprising:

an anchor bolt having a threaded end and an anchor end;

a tubular sleeve having an internal bore positioned annularly around and extending along said bolt between the ends thereof, said ends of said bolt projecting outwardly from the ends of said sleeve, wherein said sleeve is constructed of a resilient hard rubber material, said sleeve being radially inwardly compressed around said anchor bolt to thereby form a fluid seal between said sleeve and said anchor bolt so that the internal bore of said sleeve remains substantially entirely in contact with the anchor bolt despite radial displacement of the anchor bolt to thereby maintain the fluid seal between said sleeve and said bolt.

4,162,597

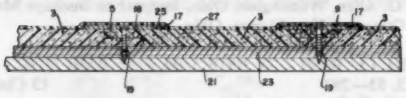
INSULATION BLOCK AND MOUNTING MEANS THEREFOR

Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710

Filed May 2, 1977, Ser. No. 792,784
Int. Cl.[2] E04B *5/00*
U.S. Cl. 52—410 **1 Claim**

1. A structure including a deck, a roof supported thereon and a plurality of rows of relatively rigid insulation blocks laid thereon in abutting position, means provided on certain insulation blocks providing a mating and sealing relationship between abutting insulation blocks and spaced apart pads pro-

vided at the adjacent corners of each four adjacent insulation blocks and each of said pads extending partially over a portion of each of the four abutting adjacent insulation blocks, means extending through said pads, the insulation blocks, the roof, and the deck for securing said pads in proper spaced apart position on said insulation blocks, and for securing said insulation blocks to said roof and deck, and said insulation blocks are



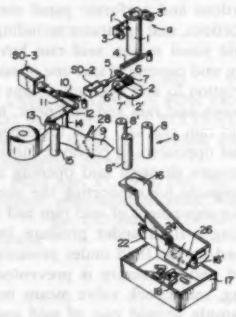
formed of a material to which adhesive is unacceptable, adhesive being acceptable to said pads, and a flexible sheet means overlaying said insulation blocks and pads and an adhesive applied to each of said pads and said flexible sheet means adhering and bonded to each of said spaced apart pads, said flexible sheet means being bonded to said insulation blocks solely at the spaced apart pads and being free of said insulation blocks in the areas between said pads.

4,162,598

APPARATUS FOR REMOVING IRREGULAR STACK OF COINS

Kenkichi Watanabe, and Hideshi Sentoku, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan

Filed Dec. 12, 1977, Ser. No. 859,675
Int. Cl.[2] B65B *57/10, 57/12*
U.S. Cl. 53—54 **3 Claims**



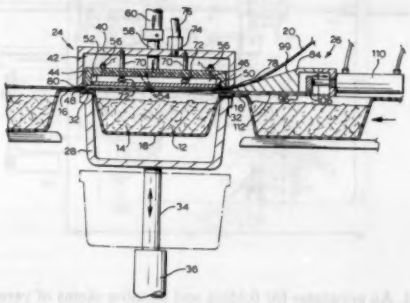
1. A coin packaging machine comprising:
(a) an accumulating cylinder for accumulating a predetermined number of coins and an electrically operated shutter means to discharge coins from said cylinder;
(b) an electrically operated means adjacent said cylinder to wrap packaging paper around the periphery of a columnar stack of coins coming from said cylinder;
(c) a coin store box adjacent said packaging means and a guiding spout between said packaging means and said coin box for guiding packaged coins to said box;
(d) means for removing irregular coins comprising:
(1) a detector on said cylinder to determine when misstacked coins are accumulated;
(2) an electrically operated gate on said guiding spout positioned to prevent, when closed, coins from entering said box;
(3) electrical means to open said shutter means and close said guiding spout gate when a signal from said detector indicates the presence of misstacked coins.

4,162,599

VACUUM PACKAGING

Rhoden R. Kyle, Toronto, Canada, assignor to C. A. Pemberton & Co. Limited, Toronto, Canada

Filed Jun. 19, 1978, Ser. No. 916,721
Int. Cl.[2] B65B *31/02, 31/04*
U.S. Cl. 53—77 **8 Claims**

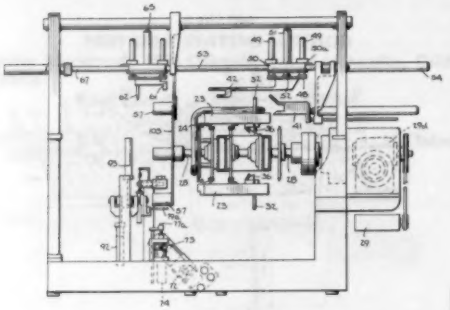


1. In combination, a sealing unit and a vacuum unit for use in a vacuum packaging machine in which a container spaced formed between oppositely disposed sealing faces have a pair of sealable webs is to be evacuated before the webs are sealed together about the periphery of the container space, said sealing unit comprising;
(a) first and second sealing dies mounted one on either side of a sealing plane for movement relative to one another between an open position to permit movement of a package forming web assembly therebetween and a closed position for engaging and sealing said web assembly, said sealing unit having an input end for receiving web to be sealed between said dies and an output end through which sealed packages are discharged; said vacuum unit comprising;
(b) primary spacer means located adjacent said input end of said sealing dies, said primary spacer means being spaced from said first die to form a first web feeding passage therebetween and spaced from said second die to form a second web feeding passage therebetween whereby said primary spacer means is located between oppositely disposed sealing faces of webs being fed into said dies through said first and second web feeding passages,
(c) secondary spacer means located adjacent said input end of said dies and mounted for movement between a retracted position permitting closure of the dies to effect sealing and an extended position maintaining at least a portion of the webs in a spaced relationship to permit evacuation of the container space formcd therebetween,
(d) means for driving said secondary spacer means to and fro between said retracted and extended positions,
(e) vacuum passage means in said vacuum drawing unit opening towards said sealing dies for communicating with the interior of a packaging space when said secondary spacer means is in said extended position to maintain said webs in a spaced relationship whereby atmosphere from the container space may be withdrawn through said vacuum passage means prior to sealing of the webs.

4,162,600
APPARATUS AND METHOD FOR FOLDING AND BANDING SKEINS OF YARN

Thomas E. Westall, and Frank Miller, both of Marion, N.C., assignors to The American Thread Company, Stamford, Conn.

Filed May 2, 1978, Ser. No. 902,032
Int. Cl.[2] B65B *63/04*
U.S. Cl. 53—120 15 Claims



1. An apparatus for folding and banding skeins of yarn comprising:

(a) a conveyor transport means having a plurality of movable generally "U" shaped loading platforms each of said loading platforms being provided with a pair of collapsible pegs which extend through the upper surface of said platforms, said platforms and pegs being adapted to transport unfolded skeins of yarn from a loading portion of the apparatus to a folding portion of the apparatus when the unfolded skeins are positioned over a pair of said pegs.

(b) a first generally "Y" shaped movable claw adapted to move across the path of the transport means and cooperate with said pairs of pegs to mechanically fold the skein of yarn positioned over said pegs,

(c) a second generally "U" shaped movable claw adapted to position the folded skein within a banding tube, said banding tube having positioned on its outer surface a preformed paper band,

(d) a doffing mechanism comprising a skein removing means and a band removal means, said skein removing means comprising a downwardly extending pin adapted to fit within the folded end portion of the folded skein when said skein is positioned within the banding tube, said band removal means comprises an arc-like member adapted to fit in frictional contact with the pre-formed band positioned on the outer surface of said banding tube, sid skein removing means and said band removal means acting simultaneously to slide the pre-formed band off the banding tube as the folded skein is withdrawn from said tube said simultaneous removal of the pre-formed band and folded skein resulting in the band being positioned around the central portion of said folded skein,

(e) a band forming means comprising a first and a second band forming finger, said first and second fingers being generally parallel to each other and adapted to move in independent, opposite arc-like directions around the general circumference of said banding tube so as to wrap a band forming slip around said tube,

(f) a band slip transfer means adapted to transfer band forming slips from a supply tray to the pair of band forming fingers for wrapping around the band tubes, and

(g) a sealing means for sealing the band forming slips into bands, subsequent to said slips being wrapped around said banding tubes,

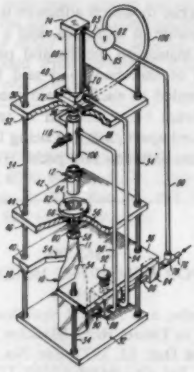
(h) a pre-formed band transfer means comprising a rotatable plate having positioned on the perimeter of one face surface a plurality of banding tubes, said plate being adapted to rotatably move each of said tubes from the band forming portion of the apparatus to a position in alignment with the folding portion of the apparatus,

(i) a timing means for controlling the action of elements a through h such that they cooperate with each other to provide for a continuous folding and banding operation.

4,162,601
SECONDARY CLOSURE, METHOD AND APPARATUS

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Filed Aug. 19, 1977, Ser. No. 825,964
Int. Cl.[2] B65B *7/28;* B67B *5/00, 3/22;* B23P *11/02*
U.S. Cl. 53—292 13 Claims



1. Apparatus for applying a capsule onto a bottle neck, said capsule being of the type comprising a sleeve member having opposite end portions and perforate panel means traversing one of said end portions, said apparatus including a ram having an opening to said panel means, said ram having means for sealingly engaging said capsule at said one of said end portions in surrounding relation to said opening, means for supporting said capsule between said ram and said neck, means for relatively moving said ram and said neck to respectively engage said capsule at said opposite end portions, means for injecting a fluid under pressure through said opening and said panel means into said capsule for supporting the same against collapse upon relative movement of said ram and said neck, said means for injecting a fluid under pressure including check valve means biased by the fluid under pressure to a position wherein the fluid under pressure is prevented from exiting from said opening, said check valve means including means engaging said capsule at said one of said end portions for displacing said check valve means so that fluid under pressure exits from said opening during at least part of the relative movement of said ram and said neck toward one another.

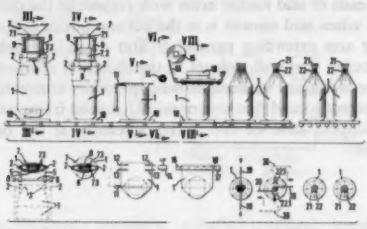
4,162,602
METHOD AND APPARATUS FOR FILLING AND CLOSING LARGE SACKS

Fritz Achelpohl; Richard Feldkämper; Carl Langemeyer; Konrad Tetenborg, and Hartmut Upmeier, all of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,200
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2652010
Int. Cl.[2] B65B *1/04, 7/06, 39/08, 43/30*
U.S. Cl. 53—415 6 Claims

1. A method of filling and closing large sacks, each large sack having a tube section including side walls, a base, and an open end portion to receive the material to be poured therein, the method comprising the steps of: engaging the open end portion

of the sack at opposite sides thereof and opening the side walls of the sack, freely suspending the sack from its open end portion, depositing a pourable material through the open end portion of the freely suspended sack to partially fill the sack, gradually lowering the sack onto a support when a predetermined weight of material is deposited therein while maintaining tension on the side walls of the sack, laying together, stretching and inclining sideways through an angle, the sack walls disposed above the pourable material within the sack,



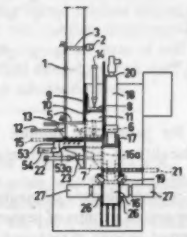
folding the upper end portion of the sack over onto itself, placing closure tape onto the folded-over end portion of the sack and one sack wall and welding the folded-over end portion to the sack wall, moving the inclined side wall portion of the sack, disposed above the poured material, through an angle to a substantially vertical position, folding the empty upper portion of the sack in a zig-zag manner, pulling the zig-zag folded portion together to form a frill, and clipping the sack portion, with an annular clip, beneath the frill.

4,162,603

METHOD AND APPARATUS FOR TRANSFORMING BY PRESSING VOLUMINOUS MATERIAL INTO BALES

Nils E. Strömberg, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Apr. 17, 1978, Ser. No. 897,121
Claims priority, application Sweden, May 5, 1977, 7705269
Int. Cl.[2] B65B *1/24, 63/02*
U.S. Cl. 53—438 **21 Claims**



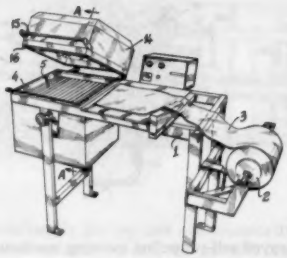
1. A method of baling material, including the steps of supplying layers of said material into a pressing chamber, compressing the material after each layer is received by applying a first compression force to each of said layers in turn, applying a greater compression force to all of said layers at once after receipt of a last layer, partially reducing said greater compression force after a predetermined time so that the compressed material in the shape of a bale is permitted to expand, and thereafter binding said material into a bale while said partially reduced compression force upon said bale is maintained.

4,162,604

PACKAGING MACHINES USING RETRACTILE THERMOPLASTIC FILM

Giuseppe Bartolomei, Rua Guanas 63, Sao Paulo, Brazil

Filed Jul. 6, 1977, Ser. No. 813,230
Claims priority, application Brazil, Jul. 16, 1976, 7604648
Int. Cl.[2] B65B *53/02*
U.S. Cl. 53—557 **8 Claims**

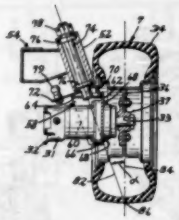


1. A compact heat-shrink packaging machine comprising, a grating; means for supplying longitudinally over the grating an elongate, longitudinally folded plastic, heat-shrinkable film for packaging in lengths of the folded films articles heat-sealed therein; a single unit for sealing successively lengths of the heat-shrinkable film each into a package and shrinking it about articles therein with heat and cutting the film along a seal transverse of the film to sever the sealed package from the film and effect a seal along the leading edge of the film for a next successive length of film to be made into a package with articles therein; said single unit comprising means defining a compartment within which said grating is disposed and having a hinged lid for opening the compartment to allow advancing the film longitudinally and introducing longitudinally a length of said heat-shrinkable film on to said grating and articles in said length of film to be packaged therein and for closing said compartment for heat-sealing and shrinking said length of film; said unit having an electrically energized sealing element having one arm along a side edge of the compartment and over which the length of film is advanced longitudinally and disposed for heat sealing the length of film transversely of the folded film and having another arm along another side edge of the compartment over which an open side of the folded film is advanced for heat sealing along the length of the open side of said length of film to close it; said lid having edges for sealing the compartment closed overlying both arms of said sealing element when the lid is closed for pressing the film overlying said arms of said sealing element and jointly with said sealing element effecting sealing of said length of film into a package and cutting the film along the seals effected; said unit having electrically energized heating elements in said compartment for heating the air therein; driven air-circulating means for circulating air heated by said heating elements through said grating to shrink the length of heat-shrinkable film about the articles therein; whereby in order to make a first package a leading length of said film is first sealed transversely along a leading edge with said one arm and lid and the lid is opened and said length of film is advanced over said grating and sealed with said articles therein and the film is severed from said length while the lid is closed and the leading edge thereof is sealed for insertion of articles into the next successive length of film before advancing it onto the grating.

4,162,605
REAR WHEEL SUPPORT APPARATUS FOR A THREE WHEEL VEHICLE

Paul H. Olin, Bloomington, and David J. Scherbring, Edina, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Feb. 7, 1978, Ser. No. 875,755
Int. Cl.[2] A01D *35/24*
U.S. Cl. 56—7 **10 Claims**

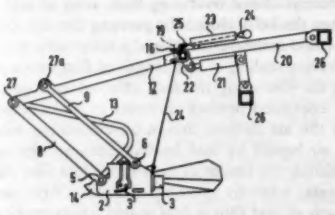


1. An improved self-propelled mowing machine suitable for cutting grass and the like, which comprises:
(a) a body;
(b) three drive wheels rotatably carried on the body for movably supporting the body relative to the ground, two of the drive wheels being located opposite to one another and the third drive wheel being disposed in a triangular relationship relative to the first two drive wheels;
(c) at least one cutting unit located on the body and suited for engaging the ground to cut the grass; and
(d) means for pivotably supporting the third drive wheel for steering the body, the supporting means being connected to a selectively operable steering mechanism on the body, the supporting means being further configured such that rotation of the third drive wheel from a normal straight ahead position to a turned position relative to the body tends to move the body upwardly, whereby the weight of the body bears down on the third drive wheel and tends to move the third drive wheel back to its normal straight ahead position when the steering mechanism is released by an operator.

4,162,606
MOWER FOR MOUNTING ON THE FRONT END OF AN AGRICULTURAL VEHICLE

Ernst Weichel, Postfach 1180, 7326 Heiningen, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,548
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652736
Int. Cl.[2] A01D *35/14*
U.S. Cl. 56—15.9 **5 Claims**

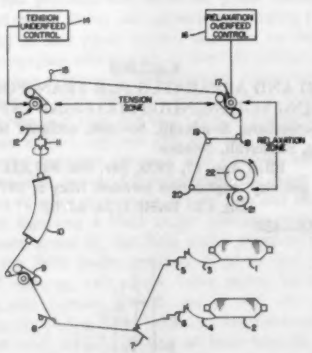


1. A mower for mounting on the front end of an agricultural vehicle comprising a substantially U-shaped frame having first and second arms with free ends extending in the direction of travel when the mower is in a cutting position, means pivotally connecting said frame to the front end of the vehicle for movement of said frame between a non-operating and the cutting position, first and second rocker arms pivotally connected at one end thereof to the free ends of said first and second arms respectively for pivotal movement about an axis transverse to the direction of travel of said mower, at least one cutter assembly having first and second support shoes at the ends thereof pivotally suspended from the other ends of said first and second rocker arms, said pivotal connection of said rocker arms to the free ends of said U-shaped frame arms being located in front of the pivotal connection of said support shoes to the other ends of said rocker arms with respect to the direction of travel when said mower is in the cutting position, and a third rocker arm extending parallel to and positioned behind said first rocker arm with respect to the direction of travel of said mower, said third rocker arm being pivotally connected to one end thereof to said first arm of said U-shaped frame and to said first support shoe of said cutter assembly at the other end thereof.

4,162,607
ENTANGLED YARNS

Bron W. Spivey, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 1, 1977, Ser. No. 812,436
Int. Cl.[2] D02J *1/22*; D02G *1/00*
U.S. Cl. 57—287 **13 Claims**



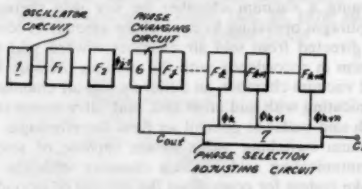
1. A process for producing bundle yarn having neutral torque from a plurality of groups of textured filaments comprising the steps of:
supplying a prescribed degree of positive tension to respective plural separated groups of textured filaments by passing the separated groups of textured filaments from a first yarn feed roller means to a second yarn feed roller means, at least two of said groups having been imparted with opposing torques;
bringing the tensioned plural separated groups of textured filaments together; and
causing the tensioned groups of textured filaments to relax between said second yarn feed roller means and a yarn take-up means,
whereby the oppositely-torqued groups of textured filaments are caused to tangle themselves together to form bundle yarn having a resultant neutral torque.

4,162,608

ELECTRONIC TIMEPIECE FREQUENCY REGULATING CIRCUIT

Shinji Morozumi, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 583,922, Jun. 5, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,358
Claims priority, application Japan, Jun. 5, 1974, 49-63670
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 R **15 Claims**



1. In an electronic timepiece including oscillator means for producing a high frequency time standard signal, divider means having a series-connected chain of frequency divider stages, at least one of said divider stages in response to the application of said high frequency time standard signal to said divider means producing a timekeeping signal, and display means adapted to display time in response to said timekeeping signal applied thereto, the improvement comprising phase changing means series-connected to said series-connected divider chain between a divider stage just prior thereto and a next divider stage for applying an intermediate frequency signal from said divider stage just prior thereto to said next divider stage, phase selection adjusting signal means coupled to at least one of said series-connected divider stages in said divider chain after said next divider stage for receiving a control frequency signal produced thereby, and in response thereto selectively applying a two-state phase selection adjusting signal to said phase changing means, said phase changing means being adapted to be selectively disposed into one of a retard mode and an advance mode, said phase changing means in response to said intermediate frequency signal produced by the divider stage just prior thereto and the phase selection adjusting signal being adapted to apply to the next divider stage said intermediate frequency signal retarded by at least 180° for each change of state of said phase selection adjusting signal applied thereto when said phase adjustment means is disposed in a retard mode, said phase changing means being further adapted in response to the intermediate frequency signal produced by the divider stage just prior thereto and the phase selection adjusting signal applied thereto to apply to the next divider stage said intermediate frequency signal advanced by at least 180° for each change of state of said phase selection adjustment signal applied thereto when said phase changing means is disposed in an advance mode.

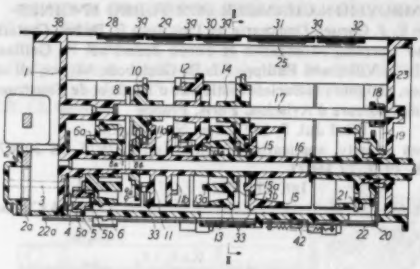
4,162,609

FILM DISPLAY CLOCK

Masaaki Oishi; Itaru Ashida, and Tetsuro Suzuki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Jul. 22, 1977, Ser. No. 818,329
Claims priority, application Japan, Jul. 23, 1976, 51-87868
Int. Cl.[2] G04B 19/20; G04C 21/16
U.S. Cl. 58—38 R **9 Claims**

1. A digital film display clock comprising a casing having a horizontally elongate window at its front, a horizontal drum shaft disposed rearwardly of and parallel to the length of said window, a seconds drum, unit minutes drum, tens minute drum and hour drum on said shaft, all of said drums being of equal diameter, a seconds film band, unit minutes film band, tens minute film band and hour film band running on and driven by said drums respectively, all of said film bands being digital and of the same length, guide means for guiding said film bands past said windows to be viewed therethrough, said guide means comprising interior guide means engaging inner faces of said bands and exterior guide means engaging outer faces of said bands, said guide means for all of said bands being aligned with one another, a synchronous motor for driving said seconds drum, first carry-over means actuated by said seconds



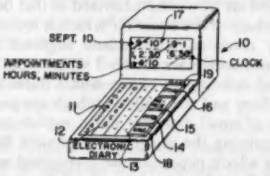
drum for intermittently driving said unit minutes drum, second carry-over means actuated by said unit minutes drum for intermittently driving said tens minutes drum, and third carry-over means actuated by said tens minutes drum for intermittently driving said hour drum, whereby digits on said bands are successively viewable through said window to present a digital time reading.

4,162,610

ELECTRONIC CALENDAR AND DIARY

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015

Filed Dec. 31, 1975, Ser. No. 645,645
Int. Cl.[2] G04B 47/00
U.S. Cl. 58—148 **13 Claims**



1. An electronic diary, calendar, and clock comprising:
an electronic clock for cumulatively determining the actual date and time-of-day as a number of functions including minutes, hours, days, and months,
an electronic visual display for displaying the actual time-of-day, day and month,
an electronic memory means for storing a plurality of time-of-day appointments for each of a plurality of different days, including present and future days,
manually controlled means coupled to said memory for selecting, at will, each of the present and future days, individually, and for entering into and storing in said memory for that selected day digital data corresponding to a plurality of different time-of-day appointments,
said manually controlled means including manually controlled correction and update means for selectively changing and updating, at will, in the memory the digital data for any given appointment time-of-day for any of said given present and future days, thereby to enable the schedule of time appointments in said memory for any given day to be corrected and rendered current at any time,
said manually controlled means including manually controlled retrieval means for selectively accessing said elec-

tronic memory, at will, for any one of the plurality of different days, and for reading out the stored schedule of time-of-day appointments to said electronic display for concurrently displaying the plural appointment times for that day.

4,162,611

COMBUSTION CHAMBER FOR TURBO ENGINES

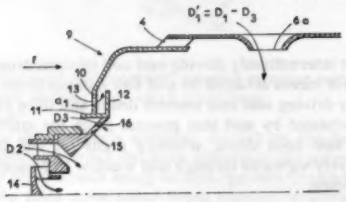
Jacques E. J. Caruel, Dammarie les Lys; Jean R. Bedue, Creteil; Bruno Deroide, Montgeron la Foret; Jean-Paul R. Gaillac, Combs la Ville, and Philippe M. D. Gastebois, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jul. 5, 1977, Ser. No. 812,636

Claims priority, application France, Jul. 7, 1976, 76 20707; May 18, 1977, 77 16071

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.65 **24 Claims**



1. In a combustion chamber for turbo engines, comprising a primary or combustion zone, provided with primary holes providing for the radial injection of a first air flow, a dilution and mixing zone, in which a second air flow is injected, and at least one injector of the pneumatic atomization prevaporization type, mounted on the base, with their axes parallel to that of the chamber means providing for the introduction of the fuel due to a third air flow, characterized in that between each injector and the base of the chamber which is located upstream of the primary zone, an intermediate segment is provided having dimensions which are reduced with respect to those of the chamber and defining a volume which flares in the direction of the gas flow and the walls of which are provided with a large number of small diameter holes, which are uniformly distributed, permitting the injection of a fourth flow of air in the form of jets which penetrate the carburized mixture from the injector, the first, third, and fourth air flows in total comprising the primary air which is necessary for the combustion reactions, this fourth flow of air representing 1/6 to ½ of the primary air, the third and fourth air flows which are adding being such that they form a stoichiometric mixture with the fuel which is injected at low operation in the intermediate zone; the first, third and fourth air flows which are added form, with the fuel, a stoichiometric mixture in the combustion zone during normal operation.

4,162,612

EXHAUST GAS CLEANING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tadao Mitsuda, Susono; Takeru Yasuda, Nagoya, and Yoshiki Fukumori, Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Oct. 25, 1977, Ser. No. 845,233

Claims priority, application Japan, Jul. 5, 1977, 52/79475

Int. Cl.² F01N 3/15

U.S. Cl. 60—276 **9 Claims**

1. An exhaust gas cleaning apparatus for an internal combustion engine, said apparatus comprising:

a three-way catalytic converter, arranged in the exhaust system of said engine, for effectively eliminating toxic components remaining in the exhaust gas when the air-fuel ratio of the exhaust gas directed to said converter is kept near a stoichiometric value;

air pump means driven by the crankshaft of said engine;

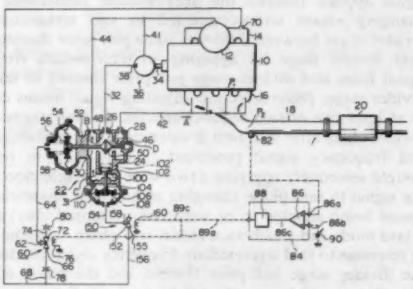
pipe means connected on one end thereof to said air pump means for receiving secondary air from said air pump means and connected on the other end thereof to said exhaust system at a position located upstream of said catalytic converter for introducing secondary air into said exhaust system;

a flow control valve means having an air chamber located on said pipe means, said valve means has a diaphragm for forming a vacuum chamber on one side thereof, said diaphragm operating to control the amount of secondary air directed from said air chamber toward said exhaust system in accordance with the vacuum pressure level in said vacuum chamber, an outlet on said air chamber communicating with said other end, said valve means coacting with said outlet to control air flow therethrough;

a vacuum switching valve means capable of selectively communicating said vacuum chamber with the engine intake system for controlling the amount of secondary air passed through said flow control valve means;

a sensor means arranged in the exhaust system for detecting a predetermined value of the air-fuel ratio near said stoichiometric value;

a control unit for operating said vacuum switching valve means in such a manner that said switching valve means is in a first position when a first electric signal, which indi-



cates that the air-fuel ratio is smaller than the predetermined value, is received by said control unit to increase the amount of secondary air directed into said exhaust system from said air chamber of said flow control valve means, and in such a manner that said switching valve means is in a second position when another electric signal, which indicates that the air-fuel ratio is larger than the predetermined value, is received by said control unit for decreasing the amount of secondary air directed into said exhaust system from said air chamber;

a by-pass valve means for selectively connecting said air chamber with the atmosphere; and

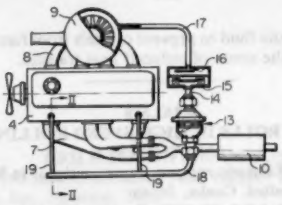
an actuator means connected to said control unit for operating said by-pass valve means in such a manner that said by-pass valve means is situated so that said air chamber is disconnected from the atmosphere when said vacuum switching valve means is switched to its first position, so as to cause a rapid increase of a limited amount of secondary air directed to said exhaust system for quickly increasing the air-fuel ratio to a value near said stoichiometric value, and in such a manner that said by-pass valve is situated so that said air chamber is connected with the atmosphere when said vacuum switching valve means is switched to its second position, so as to cause a rapid decrease of a small amount of secondary air for quickly decreasing the air-fuel ratio to a value near said stoichiometric value, whereby the air-fuel ratio of the exhaust gas directed to said three-way catalytic converter is effec-

tively maintained near said stoichiometric value for producing an idealized operation of said converter.

4,162,613
EXHAUST GAS PURIFIER OF AN INTERNAL COMBUSTION ENGINE

Tetsuomi Tamura, Toyota, and Koichi Mizutani, Seto, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 674,238, Apr. 6, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,072
Claims priority, application Japan, Dec. 26, 1975, 50-154848
Int. Cl.[2] F01N *3/10;* F02M *25/06*
U.S. Cl. 60—278 9 Claims

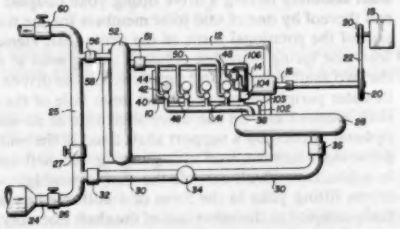


1. An exhaust gas purifier in a four-stroke internal combustion engine having an exhaust passage and an air cleaner having therein a dust portion and a clean portion which is connected to a cylinder of the engine, said purifier comprising: a secondary air conduit communicating said dust portion with said exhaust passage; a silencer disposed in said secondary air conduit; a reed valve disposed in said secondary air passage between said silencer and said exhaust passage and arranged to open automatically in response to a decrease in pressure below a predetermined value in said exhaust passage to permit the supply of a secondary air into said exhaust passage; and an air filter disposed in said secondary air passage between said silencer and said reed valve.

4,162,614
PRESSURE FLUID OPERATED POWER PLANT

John E. Holleyman, Monroe, La., assignor to J.J.J. Air Injection Systems, Monroe, La.

Filed Sep. 13, 1977, Ser. No. 832,723
Int. Cl.[2] F15B *11/20, 13/07*
U.S. Cl. 60—370 4 Claims

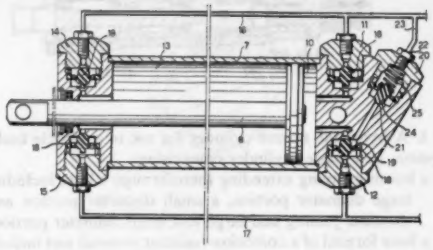


1. A power plant adapted to have its pistons and its valves operated by a pressure fluid comprising, in combination; a piston and cylinder type engine having a drive shaft rotatable by the reciprocating pistons; and inlet manifold connected to a source of pressure fluid and an exhaust manifold; a unitary inlet and exhaust valve means positioned between and connected to each cylinder and said manifolds; timing means including a pressure fluid distributor connected to each of said unitary valve means for admitting pressure fluid thereto to move it cyclically to inlet position for admitting pressure fluid to said cylinders to reciprocate said pistons; and spring means for returning each of said unitary valve means to exhaust position upon the completion of each of said piston's working stroke.

4,162,615
HYDRAULIC FLUID TANK PRESSURIZATION DEVICE

Giorgio Grattapaglia, and Carlo Cecchi, both of Torino, Italy, assignors to Fiat-Allis Macchine Movimento Terra S.p.A., Lecce, Italy

Filed Jun. 23, 1977, Ser. No. 809,154
Claims priority, application Italy, Jul. 28, 1976, 68885 A/76
Int. Cl.[2] F04B *49/08;* F15B *1/06*
U.S. Cl. 60—478 4 Claims



1. An air pressurizing system for pressurizing an air space in a reservoir containing hydraulic fluid which varies in quantity in response to movement of hydraulically actuated equipment coupled in fluid communication therewith comprising

a pneumatic cylinder having a reciprocable piston and piston rod movable within a chamber for compressing air within said chamber,

the piston rod of said pneumatic cylinder operatively connected by mechanical means to hydraulically actuated equipment for movement of said reciprocal piston in response to movement of the hydraulically actuated equipment mechanically connected thereto,

air inlet valve means in fluid communication with said pneumatic cylinder chamber for passing air thereinto in response to reciprocal movement of said piston rod,

air outlet valve means in fluid communication with said pneumatic cylinder chamber for passing compressed air therefrom in response to reciprocal movement of said piston rod,

reservoir means for containing hydraulic fluid which varies in quantity in response to movement of the hydraulically actuated equipment mechanically connected to said pneumatic cylinder and having an air space therein which varies in volume in response to the amount of hydraulic fluid contained in the reservoir means,

discharge conduit means providing direct and continuous open fluid communication between said air outlet valve means and said reservoir means and acting solely to pass air compressed by movement of said piston rod to said air space for maintaining a predetermined level of pressurization thereof during movement of the hydraulically activated equipment, and

pressure relief means in fluid communication with said air outlet valve means and said discharge conduit means to control the pressurization of air delivered to said reservoir means,

said pressure relief means comprising a pressure relief valve having an outlet in fluid communication with said air inlet valve means to bypass compressed air thereto when the compressed air passed from said air outlet valve means through said discharge conduit means to said air space increases the pressurization of the air space above a predetermined level.

4,162,616

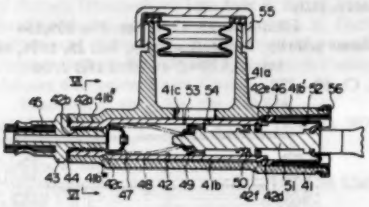
HYDRAULIC MASTER CYLINDER

Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Division of Ser. No. 678,718, Apr. 2, 1976, abandoned. This application Oct. 12, 1977, Ser. No. 841,435

Int. Cl.[2] F15B 7/00

U.S. Cl. 60—533 **5 Claims**



1. A hydraulic master cylinder for use in a vehicle braking system, said master cylinder comprising:

a housing having extending therethrough a bore including a large diameter portion, a small diameter portion and a shoulder joining said large and small diameter portions;

a liner formed of a corrosion-resistant material and including a large diameter portion, a small diameter portion and a shoulder joining said large and small diameter portions of said liner;

said liner being tightly and nonrotatably positioned within said bore of said housing, with the outer surfaces of said large and small diameter portions of said liner tightly contacting the inner surfaces of said large and small diameter portions of said bore of said housing, respectively;

a piston slidably positioned within said liner;

said small diameter portion of said liner having a threaded inner surface; and

a connecting member having an externally threaded portion in threaded engagement with said threaded inner surface of said small diameter portion of said liner and an outwardly extending flange axially abutting a free end surface of said housing, said connecting member thereby comprising means for axially urging said liner toward said small diameter portion of said bore and for thereby urging the outer surface of said shoulder of said liner against the inner surface of said shoulder of said bore, said connecting member having extending therethrough a passage for communicating the interior of said liner with an exterior wheel cylinder.

4,162,617

PULSED CRYSTALLIZER WITH STRIPS OF REDUCED HEAT EXCHANGE

Paul Schmidt, Heinrich-Kampchenstr. 3, 4300 Essen 17, and Peter Walzel, Brunnenstrasse 47, 4300 Essen 1, both of Fed. Rep. of Germany

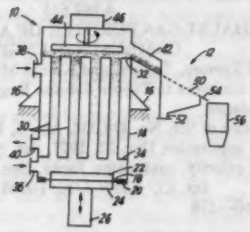
Filed Jul. 14, 1977, Ser. No. 815,713

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711789; Austria, Mar. 18, 1976, 2027/76

Int. Cl.[2] B01D 9/04

U.S. Cl. 62—123 **8 Claims**

1. Apparatus for crystallizing chemical species in a fluid comprising a fixedly mounted heat exchange surface for cooling the fluid to cause crystals to form in the fluid and means for pulsating the fluid at a frequency between 0.5 and 200 Hz with a component of pulsation parallel to the heat exchange surface having amplitude at least 0.5 mm to prevent any crystals from forming on the heat exchange surface, the heat exchange surface including a plurality of longitudinal, laterally spaced zones of reduced heat transfer substantially parallel to the direction



of pulsation of the fluid to prevent crystals from forming in the fluid adjacent the zones of reduced heat transfer.

4,162,618

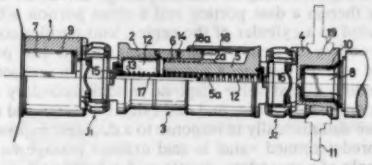
DEVICE FOR ROLLS IN HIGH SPEED ROLLING MILLS AND THE LIKE

Hiroji Okuda, Kitakatsuragigun, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 819,216

Int. Cl.[2] F16D 3/06; F16C 35/08

U.S. Cl. 64—23 **1 Claim**



1. A driving device for rolls in high speed rolling mills and the like, wherein a drive shaft element and a driven shaft element are interconnected by a drive shaft which is longitudinally extensible and which effects the centering of the drive shaft element and of the driven shaft element and the transmission of torque by means of joint members included at two places in the drive shaft, said driving device comprising:

a shaft assembly which renders said drive shaft longitudinally extensible, said shaft assembly comprising two shaft members in the form of sleeves fitted together as by a spline connection so as to be only axially slidable, said shaft assembly having a drive fitting yoke coupled to one end thereof by one of said joint members for the transmission of the rotational force of the drive shaft element,

at least one spring provided between spring seats at ends of the two shaft elements and supported on the driven side at its outer peripheral portion by an inner hole of the driven shaft element and on the drive shaft side at its inner peripheral portion by a support shaft fixed in the end of the drive shaft element, said spring urging the shaft assembly in a direction which extends the shaft assembly,

a driven fitting yoke in the form of a bottomed cylindrical body coupled to the other end of the shaft assembly by the other joint member and loosely fitted on the driven shaft element in such a manner that the transmission of torque to the driven shaft element is possible, said driven fitting yoke and said driven shaft element having a fit between an oval-shaped modified shaft and a hole of a corresponding shape, the inner bottom of said driven fitting yoke and the end surface of said driven shaft element being provided at their respective centers with fitting means for bringing the axes of the driven fitting yoke and the driven shaft element into alignment with each other, said fitting means being a conical opening and a conical projection adapted to be tightly fitted in the conical opening, said conical opening

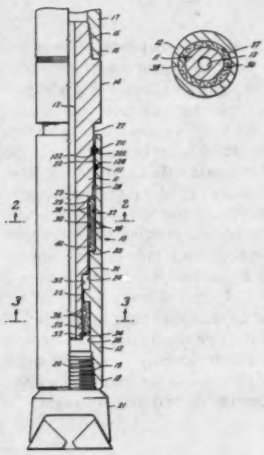
being provided either at the center of the inner bottom surface of the driven fitting yoke or at the center of the end surface of the driven shaft element, said conical projection being provided at the other center.

4,162,619

DRILL STRING SHOCK SUB

Jeddy D. Nixon, Jr., Houston, Tex., assignor to Maurer Engineering, Inc., Houston, Tex.

Filed Feb. 8, 1978, Ser. No. 875,991
Int. Cl.[2] F16D 3/17; E21B 17/42
U.S. Cl. 64—23 17 Claims



1. A shock sub for use in a drill string for absorbing longitudinal, radial, and torsional vibration and impact loads comprising

a tubular housing adapted for connection to one part of a drill string,

a mandrel extending longitudinally into said housing and having an end portion adapted for connection to another part of a drill string,

said mandrel and said housing each having a shape defining a non-circular annular cavity when assembled together,

compressible, elastic, metallic spring means positioned in and substantially filling said non-circular annular cavity,

such springs means being compressible longitudinally, radially and circumferentially of said cavity to absorb longitudinal, radial and torsional vibration and impact loads and to transmit rotary movement between said housing and said mandrel upon rotation of one of said members by said drill string, and

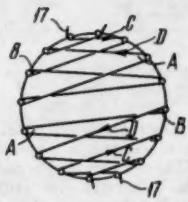
means securing said housing and mandrel together to maintain said spring means in longitudinal compression.

4,162,620

CIRCUIT-KNIT CLOSED END TUBULAR ARTICLE

Vladimir K. Raevich, Kutuzovsky prospekt, 9, kv. 188; Evgeny I. Petrov, ulitsa Beloveshskaya, 91, kv. 77; Elena N. Kolesnikova, Melerovsky proezd, 1/1, korpus 2, kv. 44, and Alexandr K. Saxon, Sirenevy bulvar, 69, korpus 4, kv. 17, all of Moscow, U.S.S.R.

Continuation of Ser. No. 639,430, Dec. 10, 1975, abandoned, which is a continuation of Ser. No. 428,858, Dec. 27, 1973, abandoned, which is a continuation of Ser. No. 269,187, Jul. 5, 1972, abandoned. This application Feb. 9, 1978, Ser. No. 876,241
Claims priority, application U.S.S.R., Jul. 6, 1971, 1671923; Jul. 6, 1971, 1671924
Int. Cl.[2] D04B 9/56
U.S. Cl. 66—187 4 Claims



1. A tubular knit article knit with a closed end on a circular knitting machine, comprising a linking course of opposite-lying loops positioned on a plurality of opposite circumferential portions which define the tubular end to be closed; a linking thread passing through said opposite-lying loops in a zigzag manner such that subsequent to passing through a loop on one circumferential portion it passes through another loop on an opposite circumferential portion before it again passes through the loop adjacent to the loop on said one circumferential portion so that the opposite-lying loops in the linking course are drawn together until their complete butt closing is aligned, thus forming a linear seam.

4,162,621

BASKET OVERFLOW FOR WATER RECIRCULATING CLOTHES WASHING MACHINE

Aidan M. Stone, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 17, 1978, Ser. No. 896,874
Int. Cl.[2] D06F 13/02, 23/04, 37/00
U.S. Cl. 68—23.2 5 Claims

1. In a clothes washing machine including:

a tub;

a generally cylindrical clothes receiving basket mounted within said tub, said basket being formed with a series of openings in the bottom thereof;

means for washing and rinsing clothes disposed in said basket and removing water from said basket after said washing and rinsing;

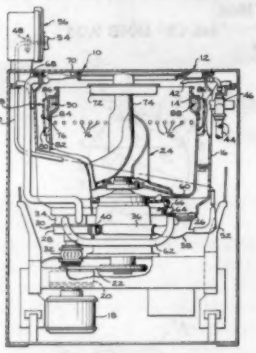
recirculation pump means causing water entering said tub through said basket openings to be recirculated into said basket at a faster rate than water flow into said tub

through said bottom openings in said basket during said washing and rinsing;

whereby said level of water in said tub is reduced below the level of said water in said basket during said washing and rinsing;

a series of overflow openings formed about the periphery of said basket at a level vertically spaced above said bottom basket openings;

a gutter ring secured to the exterior of said basket extending about said basket periphery at a level substantially aligned with said overflow openings in said basket;



said gutter ring defining a trough extending about said basket and in fluid communication with said overflow openings;

said gutter ring including an upper edge extending vertically above the level of said overflow openings, whereby water flow enters said trough and rises to said upper edge of said gutter ring prior to overflow into said tub;

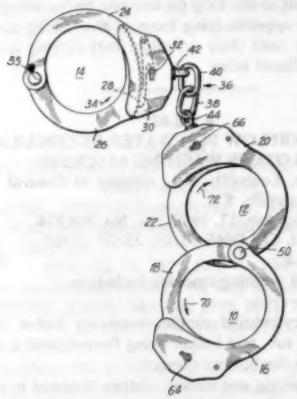
whereby the water level in said basket will rise to the level of said upper edge of said gutter ring.

4,162,622

MULTIPLE-CUFF HANDCUFF

Joseph Daleo, Deer Park, N.Y., assignor to Triple Cuff Corporation, Melville, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,368
Int. Cl.[2] E05B *75/00*
U.S. Cl. 70—16 **8 Claims**



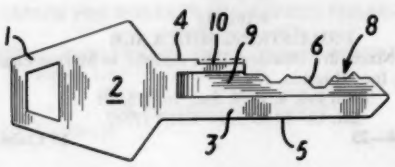
1. A multiple-cuff handcuff comprising first means including first and second cuffs pivotally interconnected for movement in two parallel planes, a third cuff, and coupling means flexibly coupling said third cuff to said first means, said coupling means including a chain consisting of a plurality of interengaged links, said first means including a pivot pin common to said first and second cuffs and about which said first and second cuffs pivot in said planes, said first and second cuffs being free on said pin to pivot into overlapping, generally coincident relation.

4,162,623

KEY AND LOCK SYSTEM

Noelle Yorio, and Albert E. Yorio, both of 70 W. St., Harrison, N.Y. 10582

Continuation-in-part of Ser. No. 780,662, Jun. 8, 1977. This application Sep. 15, 1977, Ser. No. 833,447
Int. Cl.[2] E05B *19/06, 27/04*
U.S. Cl. 70—364 A **11 Claims**



1. A lock system comprising a combination of (1) a first pin-tumbler lock having an outer cylinder and a rotating cylinder plug, the cylinder plug having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the outer cylinder and cylinder plug, wherein the lock pins project into the barrel; (2) a second pin-tumbler lock, substantially shorter than the first lock, having an outer cylinder and a rotating cylinder plug, the cylinder plug having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the outer cylinder and cylinder plug, wherein the lock pins project into the barrel, and (3) a key having a conventional handle portion and shank portion with a series of notches and projections extending along one longitudinal edge of the shank portion which engage the tumbler pins of the first pin-tumbler lock upon insertion of the key so as to render the lock operable, and which engage the tumbler pins of the second pin-tumbler lock upon insertion of the key to render the second lock operable.

4,162,624

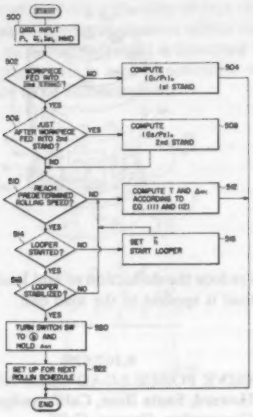
TENSION CONTROL METHOD FOR A ROLLING MILL

Yasuo Morooka, and Shinya Tanifuji, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 31, 1978, Ser. No. 892,180
Claims priority, application Japan, Mar. 31, 1977, 52/35269
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 **12 Claims**

1. In the control of a tension of a workpiece which is rolled by a tandem rolling mill, a tension control method for a rolling mill characterized in that a looperless tension control in which a tension is computed from a driving current for rolls and a rolling load and in which the tension is controlled in accordance with a deviation from a desired tension is executed during a threading stage of a top end of the workpiece and during a tail-out stage, while a tension control with a looper is executed during a steady rolling from completion of said

threading stage of said top end to commencement of said tail-out stage, both the tension controls being changed-over in



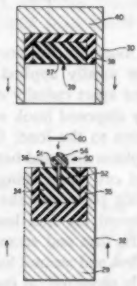
dependence on the rolling process so as to control said tension of said workpiece.

4,162,625

METHOD AND APPARATUS FOR FORMING DENTAL COPINGS

David E. Simmons, 3600 Prytania St., New Orleans, La. 70115

Filed Jan. 24, 1978, Ser. No. 871,810
Int. Cl.[2] B21D *22/12*
U.S. Cl. 72—54 **22 Claims**



1. An apparatus for forming dental copings comprising:

a. a first compression member providing a first pliable compression surface;

b. a tooth die attachable to the surface of said first compression member at said first pliable surface;

c. a second compression member in cooperative relationship to said first compression member said second compression member providing a second pliable compression surface;

d. a sheet of coping material sized to coverably fit over said tooth die; and

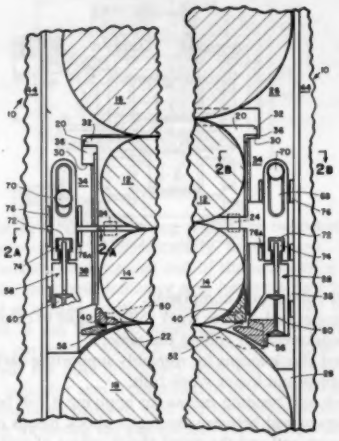
e. compression means for urging said first compression and said second compression member together, said sheet of coping material being deformed to substantially conform to the shape of said tooth die when said first compression member and said second compression member are urged together by said compression means.

4,162,626

ROLLING MILL

Elmer E. Decima, Pittsburgh, and Albert T. Briggs, Tarentum, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.

Filed May 3, 1978, Ser. No. 902,534
Int. Cl.[2] B21B *31/10*
U.S. Cl. 72—238 **11 Claims**



1. In a rolling mill or the like having a pair of work roll assemblies each including a pair of opposed bearing chocks, a pair of back up roll assemblies each including a pair of opposed bearing chocks in which one of said back up roll assemblies cooperate with one of said work roll assemblies and the other said back up roll assembly cooperates with the other work roll assembly and the upright housing for receiving said work roll and back up roll assemblies with their axes arranged in a horizontal disposition, and means for raising and lowering the uppermost back up roll assembly relative to said lowermost back up roll assembly, the improvement comprising:

a frame having spaced apart parallel runners extending between and connected to the opposite sides of said opposed chocks of said lower work roll assembly,

said runners having means on their lower surfaces for allowing said lower work roll chocks to be supported on movement into and out of said housing,

a pair of spaced apart tracks constructed and arranged to extend between said opposed chocks of said lower work roll assembly in an overhung relationship with respect to a different one of said runners,

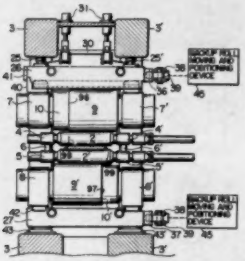
strap means for each back up roll chock connected to the inside or the outside of the vertical surface thereof for carrying a different one of said tracks and adapted on movement of said upper back up roll chocks to bring said tracks into and out of supporting relationship with said runners, and

means for allowing said lower work roll assembly to selectively support said upper work roll assembly so that when so supported and when said lower work roll assembly is supportable by said tracks, both said work roll assemblies as a unit can be inserted into or removed from said housing.

4,162,627
ROLLING MILL

Shigeru Shida, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 560,687, Mar. 21, 1975, abandoned, which is a continuation of Ser. No. 378,915, Jul. 13, 1973, abandoned. This application Mar. 16, 1978, Ser. No. 887,369
Claims priority, application Japan, Jul. 17, 1972, 52-70817
Int. Cl.[2] B21B *31/18*
U.S. Cl. 72—247 3 Claims



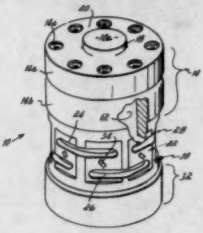
1. A rolling mill comprising:
an upper and a lower work roll arranged to contact a strip or workpiece for rolling the same;
metal chock means for rotatably supporting each end of said upper and lower work rolls;
work roll bending means for applying a roll bending force interposed between the metal chock means of said upper work roll and the metal chock means of said lower work roll;
an upper and a lower backup roll arranged in a position outside of the associated upper and lower work rolls;
metal chock means for rotatably supporting each end of said upper and lower backup rolls;
an upper and a lower guide frame arranged in a position outside of each of said backup rolls on a side thereof remote from the associated work roll, said guide frames each extending over a width of respective roll surfaces of the upper and lower backup rolls at a spacing from the respective roll surfaces and contacting said metal chock means for said upper and lower backup rolls so as to transmit a rolling force applied to said upper and lower guide frames to said upper and lower backup rolls through said metal chock means for said backup rolls; and
means for axially displacing said upper and lower backup rolls in an opposite direction to bring a side edge of an effective roll surface of the respective backup rolls substantially in vertical alignment with respective side edges of the strip or workpiece.

4,162,628
LOAD CELL

Georg Oetjen, and David L. Eck, both of Columbus, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 23, 1977, Ser. No. 863,797
Int. Cl.[2] G01L *5/12*
U.S. Cl. 73—141 A 18 Claims

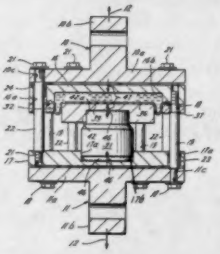
1. A load cell comprising, in combination:
a hollow central measuring column subject to strains to be measured,
a base section for supporting said hollow central measuring column, and
a load receiving section for receiving a load at substantially one point and transmitting the load substantially uniformly to said hollow central measuring column, said load receiving section including an extension extending into the hollow portion of said hollow central measuring column to reduce the deflection of said load receiving section when load is applied to the load cell.



4,162,629
TENSIVE FORCE LOAD CELL ASSEMBLY

Clayton L. Howard, Santa Rosa, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed May 16, 1978, Ser. No. 906,523
Int. Cl.[2] G01L *1/26*
U.S. Cl. 73—141 R 12 Claims



6. In a load cell assembly for providing an output signal corresponding to an axially applied tensive load: first and second axially spaced apart radially extending load receiving plates having axially disposed hook means on the outer sides thereof for connection to the load; first and second radially extending load cell plates disposed between the load receiving plates, the first load cell plate being positioned toward the second load receiving plate and the second load cell plate being positioned toward the first load receiving plate; rigid means connecting the first and second load receiving plates respectively to the first and second load cell plates; an electrical load cell centrally mounted on the first load cell plate for delivering an output singal corresponding to the force applied thereto; a centrally disposed chamber formed in the second load cell plate; a body of fluid enclosed within the chamber; a radially extending flexible diaphragm mounted on the second load cell plate and forming one wall of the chamber; and piston means disposed between the diaphragm and the load cell for transmitting force between the diaphragm and the load cell.

4,162,630
MEASUREMENT AND RECONSTRUCTION OF THREE-DIMENSIONAL FLUID FLOW

Steven A. Johnson, Rochester, Minn., assignor to University of Utah, Salt Lake City, Utah

Filed Sep. 20, 1976, Ser. No. 725,152
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A 9 Claims

1. The method of measuring the fluid vector flow field

through a measurement region which contains a plurality of volume elements comprising the steps of:

transmitting and receiving acoustic energy through the measurement region along a plurality of rays through said region such that each volume element within the region in which flow is to be reconstructed is traversed by a set of rays having components in each direction for which flow components are to be reconstructed;

measuring the time for transmission of the acoustic energy through the measurement region along said plurality of rays; and

determining the speed of sound and fluid velocity throughout the measurement region by solving the simultaneous set of line integrals which relate the fluid velocity and sound speed to the measured propagation time along said rays.

4,162,631

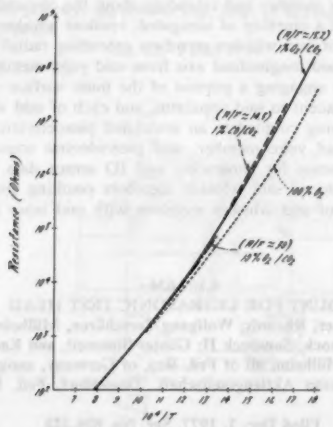
RARE EARTH OR YTTRIUM, TRANSITION METAL OXIDE THERMISTORS

Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and John K. Park, both of Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1977, Ser. No. 857,498

Int. Cl.[2] G01K *7/18*; H01B *1/06*

U.S. Cl. 73—362 AR **10 Claims**



1. A method of sensing temperature in an oxygen varying environment that contains combustion engine exhaust gas which comprises exposing to the environment a thermistor composition comprising (a) transition metal comprising iron, (b) one or more rare earth of the lanthanide series or yttrium and (c) oxygen in a respective molar ratio of the ions of about 1:1:3 and detecting its resistance.

4,162,632

LOAD CELL

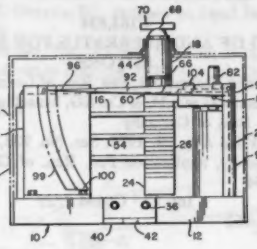
Ralph E. Steinmueller, Detroit, Mich., assignor to Harry W. Dietert Co., Detroit, Mich.

Division of Ser. No. 745,930, Nov. 29, 1976, Pat. No. 4,083,236.

This application Feb. 27, 1978, Ser. No. 881,631

Int. Cl.[2] G01D *13/00*

U.S. Cl. 73—432 A **8 Claims**



1. Indicator structure comprising a post, an indicator arm extending substantially perpendicularly to the post, pivot means for pivotally securing one end of the indicator arm to one end of the post, said indicator arm having a free end, a scale secured in a fixed position adjacent the free end of the indicator arm, a pin movable longitudinally of the post in response to a parameter which it is desired to indicate positioned adjacent the post in contact with said indicator arm whereby the indicator arm is permitted to pivot about the one end of the post in accordance with the movement of the pin, and means for mounting the pin for movement longitudinally of the indicator arm including means movable in accordance with the parameter it is desired to indicate, an L-shaped bracket, and slot and bolt means securing the L-shaped bracket to the means movable in accordance with the parameter it is desired to indicate.

4,162,633

BALANCING MACHINE

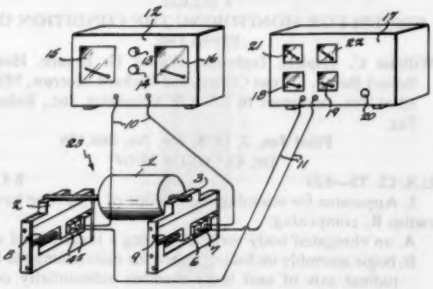
Richard Muller, Lynchburg, Va., assignor to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 922,053

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730439

Int. Cl.[2] G01M *1/22*

U.S. Cl. 73—462 **1 Claim**



1. An apparatus for balancing bodies of rotation comprising:

support means for supporting a body at two points during rotation;

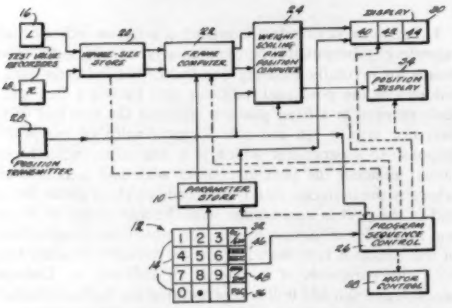
two measuring load cells at each said point for each producing a signal indicating unbalance;

measuring electronics for determining and indicating the amount of unbalance;
processing electronics for determining and indicating the amounts and locations of unbalance and for transmitting said amounts and locations to a processing machine for correcting unbalance; and
means for connecting one of said cells at each of said points to said measuring electronics and the other to said processing electronics.

4,162,634
METHOD OF AND APPARATUS FOR BALANCING ROTORS

Dionys Hofmann, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,844
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740454
Int. Cl.[2] G01M *1/22*
U.S. Cl. 73—462 **10 Claims**



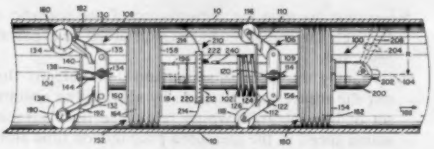
1. A method of balancing an imbalanced rotor in at least one plane, said method comprising the steps of:
storing the geometrical parameter value of said rotor;
measuring, during a test run, test values representative of imbalances;
storing said test values;
transmitting, in accordance with a program sequence control means, said geometrical parameter value and said test values to a frame computer; and
determining the size and phase relationship of counterweights to balance the rotor, utilizing said stored parameter and test values.

4,162,635
SYSTEM FOR MONITORING THE CONDITION OF A PIPELINE

William C. Triplett, Ingleside; Walter H. Brauer, Houston; Robert Burke, Corpus Christi, and Richard Morrow, Mission, all of Tex., assignors to Triad & Associates, Inc., Robstown, Tex.

Filed Jan. 3, 1978, Ser. No. 866,486
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—623 **8 Claims**

1. Apparatus for scanning the interior of a pipeline having a radius R, comprising:
A. an elongated body member having a longitudinal axis,
B. bogie assembly including means for maintaining the longitudinal axis of said body member substantially coaxial with the central axis of said pipeline,
C. sealing means extending radially from said body member, and including means for establishing a fluid-tight seal between regions in a pipeline ahead of said apparatus and regions behind said apparatus, whereby said apparatus is responsive to the pressure differential across said sealing means to move at a velocity V along said pipeline axis from regions of relatively high pressure to regions of relatively low pressure,
D. sensor means powered by said power supply for detecting one or more physical characteristics of portions of said pipeline adjacent to said apparatus, and for generating sensor data signals representative of said conditions, said sensor means including:
ultrasonic surface wave transponder including:
i. means for transmitting an ultrasonic surface wave excitation beam at an angle θ with respect to said pipeline axis, where θ is measured from said pipeline axis ahead of said body member and is less than $\pi/2$ radians, and for receiving an oppositely directed wave disturbance, said transmitted beam being adapted to excite ultrasonic waves on the interior surface of said pipeline, and having a beam width at least equal to L in the direction of said pipeline axis at a distance R from said axis, and a beam width Δ which is small compared with $2\pi R$ in the direction transverse to said axis at a distance R from said axis,
ii. means for rotating said transmitting and receiving means at an angular velocity equal to $2\pi V/L$ radians per second, and



iii. means for generating an ultrasonic surface wave sensor data signal representative of said received wave disturbance, said surface wave sensor data signal being representative of the interior surface condition of said pipeline at the point of incidence on said pipeline of said transmitted excitation beam,
wherein said sensor means further includes an inner diameter (ID) sensor means for generating ID sensor data signals representative of the inner diameter of portions of said pipeline adjacent to said apparatus,
wherein said ID sensor means includes a yoke assembly fixed to said body member and extending about the circumference thereof, and a plurality of elongated, resilient whisker members, each of said whisker members extending radially with respect to said longitudinal axis from said yoke member and adapted for engaging a portion of the inner surface of said pipeline adjacent to said apparatus, and each of said whisker members being coupled to an associated piezoelectric transducer at said yoke member, said piezoelectric transducers including means for generating said ID sensor data signals from motions of said whisker members resulting from the interaction of said whisker members with said inner surface portions.

4,162,636
MOUNT FOR ULTRASONIC TEST HEAD

Dieter Lather, Rheurdt; Wolfgang Terschüren, Mülheim; Kurt Hannöschock, Sonsbeck II; Günter Simoneit, and Karl Ries, both of Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

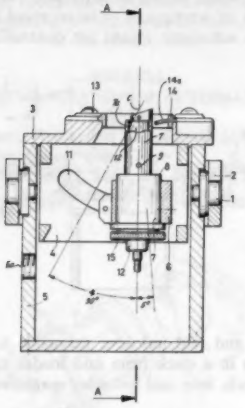
Filed Dec. 1, 1977, Ser. No. 856,223
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655364
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—638 **5 Claims**

1. A device for mounting an ultrasonic test transducer in a water container being open at the top, comprising:
gimbal support means for suspension of the container;

a cover plate having an opening and mounted to the top of the container, said cover having particular means for engagement with a test object to obtain a particular relation position to that test object;

a frame extending down from the plate, adjacent to the opening into the container;

a tubular mount having a particular axis; and



means for mounting the tubular mount to the frame and securing the mount thereto at a selective angle of the axis, the transducer being received by and mounted in the mount in particular relation to the axis, so that the orientation of the transducer is determined by the selected angle, and the transducer faces the opening in any position of adjustment.

4,162,637

SELF-LOCKING DIFFERENTIAL GEAR FOR MOTOR VEHICLES, ESPECIALLY BEVEL GEAR DIFFERENTIAL GEAR

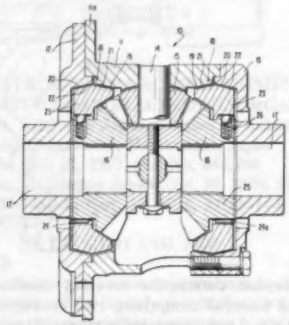
Werner Altmann, Remchingen-Nöttingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,319

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706051

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **26 Claims**



1. A self-locking differential gear for motor vehicles, comprising a rotating differential gear housing means which accommodates differential gear means, said differential gear means operatively engaging with driven gears arranged on axle shafts, and means for locking the differential gear coordinated to each differential gear means, said locking means being operatively connected with the driven gears, characterized in that an inertia means is coordinated to each driven gear, which is rotatable and axially movable with respect to the driven gear by a thread means against the action of return means, and in that said inertia means is in operative connection with double-acting locking means.

4,162,638

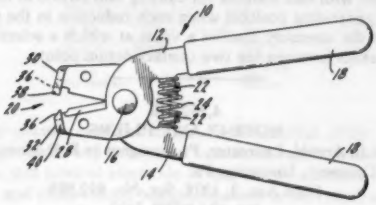
PRECISION WIRE STRIPPER

Daniel McCord, Geneva, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 741,702, Nov. 15, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,243

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 R **5 Claims**



1. In a wire stripper, a pair of longitudinally disposed levers pivoted together about an axis lateral to the longitudinal plane of the levers to perform a scissors action, manually operable handles on the levers on one side of the pivot and opposed stripping jaws on the levers on the other side, the jaws being offset to one side axially of the general longitudinal plane of the levers and having at least one set of opposed insulation cutting notches therein, and paired longitudinally disposed guide surfaces on each of the jaws on each side of the opposed notches to assure alignment of the opposed notches upon closing of the jaws, the guide surfaces on one jaw laterally bounding the guide surfaces on the other jaw.

4,162,639

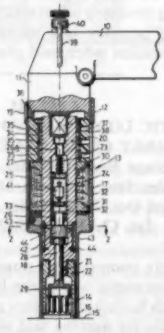
LOAD INDICATING NUT WRENCH

Peter J. Gill, Wolverhampton, England, assignor to G.K.N. Fasteners Limited, West Midlands, England

Filed May 11, 1977, Ser. No. 795,897

Int. Cl.² B25B *23/14*

U.S. Cl. 81—52.4 R **2 Claims**



1. A load indicating wrench for tightening a nut and bolt fastener assembly, which assembly includes a load indicating element and a bolt having a shank, and presents two contact datum points, said element being of a type in which a portion of the element undergoes plastic deformation when the bolt

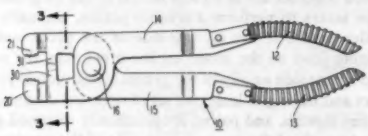
shank reaches a predetermined tension during tightening of the assembly, such plastic deformation resulting in a reduction in a dimension of the assembly measured in the direction axially of the bolt shank, and a corresponding change in the distance between the two contact datum points, said wrench comprising, in combination: first detecting means composed of an outer casing having an end wall engaging one datum point when the wrench engages the assembly; torque applying means within said casing for engaging the assembly to apply torque thereto; second detecting means centrally located within said casing and composed of a member contacting the second datum point when the wrench engages the assembly and axially movable within said casing; and signal generating means composed of a mechanically operated switch having two parts movable relative to one another into signal generating switching position, one part of said switch being fixed relative to said casing and the other part of said switch being movable with said member for causing said switch to reach its signal generating position when such reduction in the dimension of the assembly reaches a value at which a selected distance exists between the two contact datum points.

4,162,640

HOSE-CLAMP PLIERS

Robert L. Arnold, Lancaster, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.

Filed Apr. 3, 1978, Ser. No. 892,898
Int. Cl.[2] B25B *7/02*
U.S. Cl. 81—311 **2 Claims**



2. A pair of pliers for use in fastening and unfastening a hose clamp having ratchet teeth interlocking means at the two ends of a split annulus, said pair of pliers comprising:

a. first and second levers;

b. a pivot stud on which said first and second levers are mounted for pivotal movement;

c. first and second primary jaw members at the forward ends of said first and second levers;

d. first and second secondary jaw members at the forward end of said first and second levers, said secondary jaw members being located rearward of said primary jaw members and forward of said pivot stud, said secondary jaw members extending toward each other to take up overlapping positions when said pliers are closed, said first and second primary jaw members being at substantial spaced separation when said pliers are closed.

4,162,641

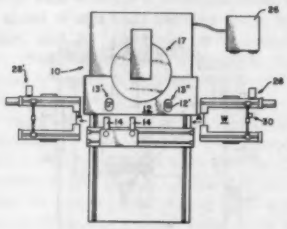
AUTOMATIC LOADING AND UNLOADING FOR NUMERICALLY CONTROLLED TURRET PUNCH

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Oct. 28, 1977, Ser. No. 846,532
Int. Cl.[2] B65H *29/28, 31/20*
U.S. Cl. 83—71 **16 Claims**

1. An assembly comprising a numerically controlled turret punch and an automatic workpiece feeding assembly therefor; said turret punch having workpiece clamping means, a punching station, means for moving said workpiece clamping means in each of two perpendicular horizontal directions with respect to said punching station, a table, and at least one locator stop associated with said table providing an original orientation for a workpiece to be brought into operative association with the clamping means;

said workpiece feeding assembly including a loader magazine located on one side of said table and having an adjustable volume for feeding a stack of workpieces to be fed to said turret punch; ejector means associated with said loader magazine for horizontally feeding workpieces one at a time in a feed direction from the loader magazine receiving volume to the turret punch; an unloader magazine, located on the opposite side of said table as said loader magazine, having an adjustable volume for receiving a stack of workpieces to be received from the turret punch; an automatic means for controlling said loader



magazine and said unloader magazine to transfer each workpiece in a stack from said loader magazine to the turret punch, into said unloader magazine; further comprising

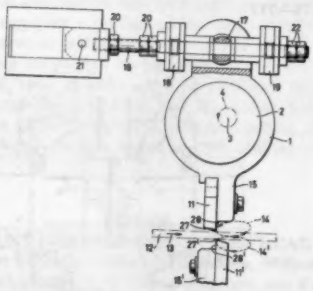
power means associated with said at least one locator stop for moving said stop vertically between positions above and below said table, and for moving said stop horizontally toward and away from said clamping means so that a workpiece engaged thereby may be moved from a position horizontally spaced from said clamping means into operative association with said clamping means.

4,162,642

ECCENTRIC CUTTERS FOR LONGITUDINALLY SEVERING ELONGATED MATERIAL TO BE DRAWN

Johann Greven, Aachen, Fed. Rep. of Germany, assignor to SCHUMAG GmbH, Aachen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,886
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638629
Int. Cl.[2] B25B *7/14*
U.S. Cl. 83—328 **9 Claims**



1. Eccentric cutters for severing continuously traveling elongated material comprising two eccentrics disposed in a common plane and eccentrically mounted in stationary bearing means, the eccentrics being rotatable in opposite directions and in synchronism with the travel of the elongated material during the severing operation, means defining between said two eccentrics, a travel path for the traveling elongated material, each of said eccentrics comprising a ring, a knife extending radially outwardly from each ring toward the other ring and toward said travel path between said eccentrics, and respective

means cooperating with each of said rings for controlling orientation of said knives with respect to the elongated material for severing the elongated material, said control means being linked to each ring at a substantially diametrically opposite point thereof from said knives, said control means comprising a rod, said ring being pivotably connected to one end of said rod at a location of said ring at which said control means are linked to the respective ring and extending from said pivot location thereof substantially parallel to said travel path, said rod being pivotable at the other end thereof at a fixed point.

4,162,643

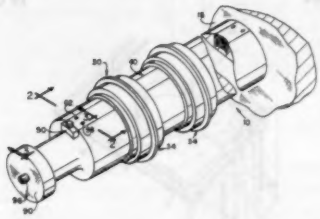
HEAD LOCKING MEANS FOR AUTOMATIC SLITTER SCORER

Robert E. Coburn, Warmister, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Jul. 11, 1977, Ser. No. 814,749

Int. Cl.[2] B23D *19/06, 35/00*

U.S. Cl. 83—499 **14 Claims**



1. Apparatus including a shaft, a plurality of heads slideable along said shaft, means for selectively positioning said heads in predetermined locations along said shaft, the improvement comprising:

(a) an elongated expandible chamber means extending along the central portion of said shaft for simultaneously locking all heads to said shaft when said chamber means is pressurized and a friction drag surface projecting in a radial direction with respect to the periphery of said shaft for a predetermined distance into contact with said heads,

(b) means independent from said chamber means to prevent inadvertent movement of the heads relative to the shaft when said chamber means is unpressurized including means for adjusting the radial distance of the outer periphery of said drag surface relative to the longitudinal axis of said shaft so that said drag surface may project beyond the periphery of said shaft while said chamber is unpressurized.

4,162,644

AUTOMATIC RHYTHM ACCOMPANIMENT APPARATUS IN AN ELECTRONIC ORGAN

Masao Sakashita, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

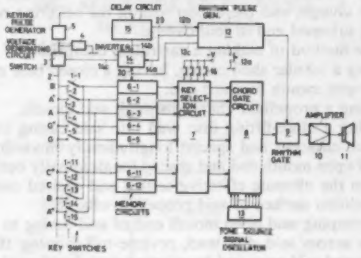
Filed Oct. 27, 1977, Ser. No. 846,208

Claims priority, application Japan, Oct. 30, 1976, 51-130053; Nov. 11, 1976, 51-134660; Nov. 12, 1976, 51-135143; Nov. 26, 1976, 51-157500[U]

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **6 Claims**

1. In an automatic accompaniment apparatus in an electronic organ having a keyboard for melody provided with a plurality of key switches for accompaniment, respective first ends of the key switches being connected to a voltage generating circuit and respective other ends of the key switches being connected to memory circuits, the memory circuits having outputs connected to a key selection circuit, a chord gate circuit connected to the key selection circuit for being opened and closed thereby, a rhythm pulse generator, and a rhythm gate controlled by the rhythm pulse generator, the chord gate circuit and rhythm gate being interposed in a circuit connecting a tone source oscillator and a speaker for producing in the speaker a rhythm accompaniment tone corresponding to the first tone in each bar of a melody, the improvement comprising a circuit connected between the key switches and the voltage generating circuit including a switch element having a control electrode, a keying pulse generator having input and output terminals, the input terminal being connected to said switch element,



a delay circuit connected to the output terminal of the keying pulse generator and an inverter connected to said delay circuit and to said control electrode of the switch element, said inverter and delay circuit being connected to said rhythm pulse generator such that the inverter is activated by a first pulse in one bar of the rhythm pulse generator to generate a signal for bringing said switch element into "ON" position, and a signal for bringing said switch element into "OFF" position is generated by a delay pulse from said delay circuit.

4,162,645

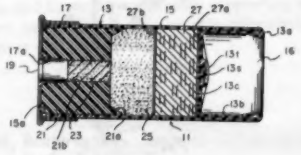
METHOD OF MAKING A CARTRIDGE

David D. Abbott, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.

Continuation of Ser. No. 495,720, Aug. 6, 1974, abandoned, which is a continuation of Ser. No. 313,004, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 13,066, Feb. 20, 1970, abandoned. This application Nov. 19, 1976, Ser. No. 743,390

Int. Cl.[2] F42B *33/10*

U.S. Cl. 86—23 **14 Claims**



1. The method of making a cartridge, comprising

holding a dual bore tubular shell casing having two interconnecting bores of respectively a small diameter for an ignition charge and a large diameter for a propellant charge, said casing having a closed base end with a primer therein in effective primer ignition communication with said small diameter bore, and an open mouth forward end,

flowing a measured loose granular primer-ignitable ignition charge in laterally guided relation through and past said open mouth and directly into said small diameter bore,

flowing a measured loose granular propellant charge through said mouth while holding said casing against intermixing movement,

inserting a close-fitting disc wad into said casing to a distance spaced longitudinally inwardly from said open

mouth end and longitudinally outwardly from the settled surface of said propellant charge,

star crimping said open mouth end of said casing to a position across said disc wad, reverse-roll-forming the star-crimped said open end by exerting peripheral axial rolling force on the annular periphery of the star-crimped end of said casing to thereby reverse-roll-form the star-crimped end of said casing and thereby correspondingly axially moving said disc wad downwardly into containing and geometrically stabilizing seated relation with said propellant charge, and thereupon sealing the resulting recessed star-crimped end of said casing.

3. The method of making a cartridge, comprising

holding a tubular shell casing, having a closed base end and an open mouth forward end,

inserting a propellant charge through said mouth,

inserting a close-fitting disc wad into said casing to a distance adjacent and spaced longitudinally inwardly from said open mouth end and spaced longitudinally outwardly from the ultimate effective settled and desired contained condition surface of said propellant charge,

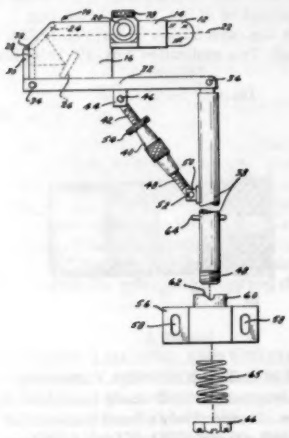
star-crimping said open mouth end of said casing to a position across said disc wad, reverse-roll-forming the star-crimped said open end by exerting peripheral axial rolling force on the annular periphery of the star-crimped end of said casing to thereby reverse-roll-form the star-crimped end of said casing and to correspondingly axially move said disc wad downwardly into containing and geometrically stabilizing seated relation with said propellant charge, and thereupon sealing the resulting recessed star-crimped end of said casing.

4,162,646

TARGET ACQUISITION SYSTEM

Joseph M. Henderson, Jr., 8239 Dr. Craik Ct., Alexandria, Va. 22306

Filed Apr. 14, 1977, Ser. No. 787,679
Int. Cl.[2] F41G 3/22
U.S. Cl. 89—41 EA **3 Claims**



1. A target acquisition system including an optical gunsight means comprising:

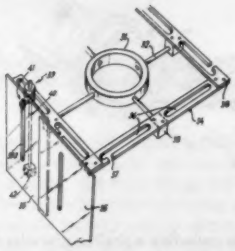
a gunsight mounting plate, adapted to receive and secure an optical gunsight including means moving said sight in azimuth and being bifurcated at one end; post means having a generally cylindrical shape and adapted to engage said mounting plate pivotally at the bifurcated end, and further having a threaded portion at the end distally from the pivot engaging end, and a cam follower means extending outwardly from the post, transverse to its longitudinal axis; turnbuckle means pivotally attached between said mounting plate and said post providing elevation adjustment about the pivot point between said gunsight mounting plate and the post; an adapter plate including a surface mating plate having an annular aperture for receiving said post and further including a cam ring having a plurality of detents whereby said cam follower will allow only selected rotation of the post means; nut means for engaging the threaded portion of the post, and spring means surrounding the post and mounted between the cam ring and nut thereby applying preselected bias to the cam follower on the cam surface.

4,162,647

MILLING MACHINE GUARD

Douglas E. Aslen, 16 Pinfold La., Romiley, Cheshire, England

Filed Jun. 14, 1977, Ser. No. 806,558
Claims priority, application United Kingdom, Jun. 17, 1976, 25074/76
Int. Cl.[2] B23C 9/00
U.S. Cl. 409—64 **19 Claims**



1. In a milling machine having a rotatable milling cutter including a guard which comprises, a mounting block on such mounting bar, a pair of support rods each extending from such block substantially in said plane, on an opposite side of said block and each having at least a part extending transversely of the mounting bar, a pair of support blocks, each movably mounted on one of said support rods and adjustable axially thereof, and a pair of guard panels, each supported by and adjustable relative to one of the said support blocks for movement in a direction generally perpendicular to the axes of its mounting bar and its support rod and normal to the said plane thereof.

4,162,648

APPARATUS FOR CONVERTING A CARTON OR THE LIKE INTO A PRESELECTED CONFIGURATION

Jack D. Kincheloe, 1620 E. Sierra, Fresno, Calif. 93710

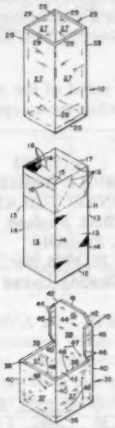
Filed Oct. 17, 1977, Ser. No. 843,067
Int. Cl.[2] B31D 5/00
U.S. Cl. 93—1 G **4 Claims**

1. An apparatus for converting a milk carton or the like, having a bottom wall integral with four upstanding, substantially right-angularly related side walls bounding an internal receptacle, into a child's block having substantially parallel end walls interconnected by four substantially right-angularly related side walls, the apparatus comprising:

A. a rigid form having a bottom wall and four substantially right-angularly related exterior surfaces arranged for individual facing engagement with the side walls of the milk carton when the form is fitted within said internal receptacle of the milk carton to retain the milk carton in rigidly erect condition and at least one of said surfaces of the form extending to a predetermined edge remote from said bottom wall;

B. a rigid housing having a bottom wall substantially normal to and integral with four substantially right-angularly

related side walls bounding an interior dimensioned to receive the milk carton, having said form fitted therewithin, in nested relation therein and in abutting engagement with the bottom wall of said housing, three of said side walls of the housing having edges remote from the bottom wall of the housing and disposed in a plane substantially parallel to said bottom wall and the fourth of said side walls of the housing extending to a remote edge spaced from said plane a distance not less than the distance from the bottom wall of the housing to the plane; and



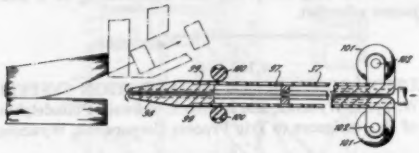
C. a pair of said members borne by the fourth side wall of the housing between said plane and the remote edge of the fourth side wall, disposed for individual facing engagement with side walls of the milk carton in right-angular relation to the fourth side wall of the housing when the milk carton is received in said nested relation in the housing, and the side members having edges interconnecting edges of the side walls of the housing in said plane and the remote edge of the fourth side wall of the housing whereby the milk carton can be marked along said edges to delineate courses for severing of the milk carton in said converting of the milk carton to a child's block.

4,162,649

SHEET STACK DIVIDER

John N. Thornton, Huntingdon, England, assignor to Wiggins Teape Limited, Hampshire, England

Filed May 18, 1977, Ser. No. 797,915
Int. Cl.[2] B31B *1/98*
U.S. Cl. 93—93 D **17 Claims**



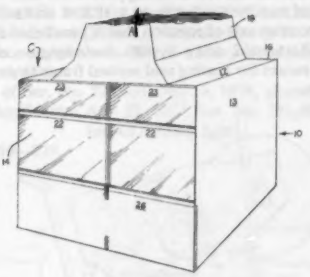
1. A layboy mechanism for the continuous stacking and delivery of batches of sheet material received from a delivery mechanism and comprising means for continuously assembling sheets into a downwardly moving stack, divider means downwardly movable with the stack for dividing the stack as it is formed into batches containing a predetermined number of sheets, auxiliary support means which move between an operative support position and an inoperative position clear of the stack, means for operating said divider means to cause an opening between the lowermost batch and a batch above it to enable the auxiliary support means to enter the stack at said opening, and means for removing said lowermost batch whilst the remainder of the stack above it is supported by said auxiliary support means.

4,162,650

BARBEQUE PIT APPARATUS

McKinley D. Davis, 210 Ridge Dr.; Robert Stearnes, 324 Ridge Dr., both of DeKalb, Ill. 60115, and Lemuel Carter, Jr., 4012 W. 19th Pl., Gary, Ind. 46404

Filed May 8, 1978, Ser. No. 903,918
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—419 **12 Claims**



1. Cooking apparatus for barbequeing meat and the like, comprising, in combination, a housing including a frame being provided with front, rear, and side walls defining an enclosure, a combustion chamber defined in the lower portion of said enclosure having an open upper end for transmitting heat and smoke, a receptacle mounted to said housing over said combustion chamber, means for removably supporting said receptacle in said enclosure interior in overlying relationship with said combustion chamber, a plurality of elongated skewer assemblies removably mounted to said housing, each skewer assembly comprising a support member and a plurality of vertically extending skewers secured to said support member for supporting meat such as ribs to be cooked, horizontally disposed rack means removably supported in said enclosure interior mounted to said skewer assemblies in overlying relationship with said skewer assemblies for supporting additional meat to be cooked, said rack means comprising a planar surface defining a plurality of apertures allowing gases to pass therethrough and means on said frame for removably supporting said plurality of skewer assemblies in side-by-side relationship in said enclosure above said receptacle.

4,162,651

DOCUMENT PRINTER

Allan Chertok, Bedford, Mass., assignor to Concord Computing Corporation, Bedford, Mass.

Filed Apr. 26, 1976, Ser. No. 680,062
Int. Cl.[2] B41F *1/00*
U.S. Cl. 101—287 **2 Claims**

1. Apparatus for printing a message on a document comprising

a document feed path defined with respect to a rigid chassis,

a printing station along said path, said printing station including impact printing means and document drive means, each of said printing means and drive means comprising first and second subunits positioned, respectively, below and above said document feed path;

first and second frames supported in said chassis, said first subunits supported on said first frame and said second subunits supported on said second frame,

said first frame supported to position said first subunits below said document feed path, and,

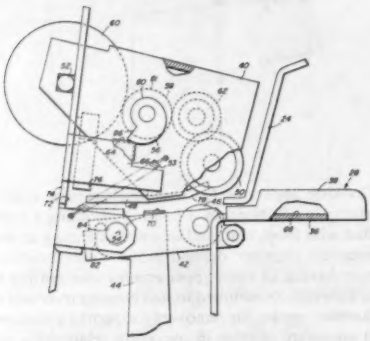
said second frame being movable between a first position

in which said drive means subunit supported thereon is spaced apart from a document positioned on said feed path and a second position in which that drive means subunit engages a document positioned on said feed path and also in which said impact printing means subunits are located with respect to each other so as to enable printing a message on said document;

a drive system for moving said second frame to its second position when a document is properly located for printing and for moving said second frame to its first position after printing of the document has been completed,

wherein said first and second subunits of said drive means comprise first and second rollers, said apparatus further including means for driving one of said rollers,

wherein said second frame is supported on said chassis for rotational movement between said first and second positions about an axis of rotation that is parallel to the axes of said rollers; said drive system including second frame biasing means for biasing said second frame toward its first position,



wherein said first frame is supported on said chassis for limited rotational motion with respect to said chassis about an axis of rotation parallel to the axes of said rollers, said apparatus further including first frame biasing means urging said first frame in a direction such that said first roller is urged toward contact with said second roller, said apparatus further including first and second stop means engagable with said first frame, said first stop means defining the limit of travel of said first roller toward said second roller such that said first roller will intercept a document proceeding along said document feed path whereby said document will avoid interferring contact with the uppermost portions of said printing means subunit supported on said first frame, said first frame biasing means having less biasing force than the biasing means for said second frame, whereby movement of said second frame to its second position forces said first frame to engage said second stop means.

4,162,652

DEVICE FOR CLEANING CYLINDER BEARERS ON PRINTING PRESSES

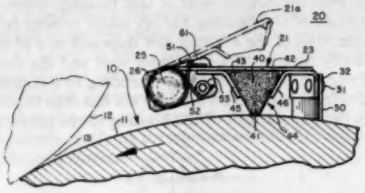
Herbert Rebel, Rodgau, and Claus Simeth, Muhlheim, both of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,546

Int. Cl.[2] B41F *35/00*; B41L *41/00*

U.S. Cl. 101—425 **8 Claims**

1. A device for continuously cleaning a bearer in a printing press having a frame comprising, in combination, a carrier in the form of a plate of metal pivoted on the frame for movement of its outer end portion toward and away from the bearer, a scraper of wearable material secured to the end portion of the plate and oriented in a generally axial direction with respect to the bearer, a spring interposed between the frame and the carrier for biasing the carrier toward the bearer, and a stop on the frame interposed in the path of biased movement of the



carrier to prevent the metal of the carrier from scraping the surface of the bearer when the scraper becomes worn away.

4,162,653

RAILWAY VEHICLE BOGIES RESILIENTLY INTERCONNECTED AXLE BOXES

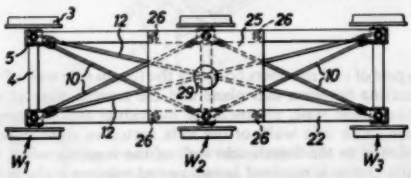
Alan H. Wickens, Duffield, England, assignor to British Railways Board, London, England

Filed Jul. 22, 1976, Ser. No. 707,577

Claims priority, application United Kingdom, Jul. 25, 1975, 31214/75

Int. Cl.[2] B61F *5/00, 5/30, 5/40, 5/52*

U.S. Cl. 105—166 **6 Claims**



1. In a railway vehicle, running gear for said vehicle comprising in combination,

at least three wheelsets each including a live axle,

an axle bearing supporting each said axle,

elastic means for interconnecting at least one axle bearing of each wheelset with at least one axle bearing of each adjacent wheelset, said elastic interconnecting means being operative in response to movement of said wheelsets away from their parallel and aligned positions to produce restoring forces to restore said wheelsets to their parallel and aligned positions, and

additional elastic means extending continuously between and interconnecting at least one axle bearing of one wheelset with the diagonally opposite axle bearing of a non-adjacent wheelset.

4,162,654

POLLUTION CONTROLLED INCINERATION SYSTEM

Albert W. Spitz, Wyncote, and Milton I. Schwab, Philadelphia, both of Pa., assignors to Trio Process Corporation, Wyncote, Pa.

Filed Jun. 15, 1977, Ser. No. 806,831

Int. Cl.[2] F23G *5/12*; F23J *15/00*

U.S. Cl. 110—212 **15 Claims**

1. In a pollution controlled incinerator system to clean gases of combustion produced within an incinerator, the combination of

a non-movable duct system having at least one inlet opening and an outlet opening;

a standpipe means positioned over the inlet opening to raise the effective height of the inlet opening above the duct system;

separate, flue-loss, portable incinerator means overfitting

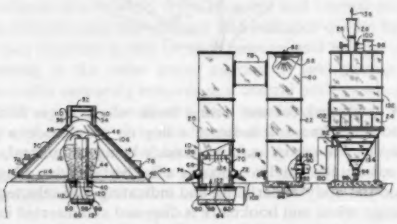
the duct inlet opening and the standpipe means, said incinerator means being adapted to direct gases of combustion through the inlet opening; and

non-movable pollution control system means receiving the gases of combustion from the duct system outlet opening;

said pollution control system means comprising means to clean at least some of the gases of combustion.

12. The method of controlling polluted air resulting from waste incinerator comprising the steps of

piling waste material about a hollow standpipe and covering the waste material and standpipe with a portable incinerator;



incinerating the waste material within the portable incinerator and creating gases of combustion;

directing the gases downwardly through the standpipe from within the incinerator into the inlet opening of a duct system;

inducing the gases through the duct system to a duct system outlet;

directing the gases upwardly through the outlet into a pollution control apparatus;

cleaning the gases within the apparatus; and

discharging the cleaned gases to atmosphere.

4,162,655

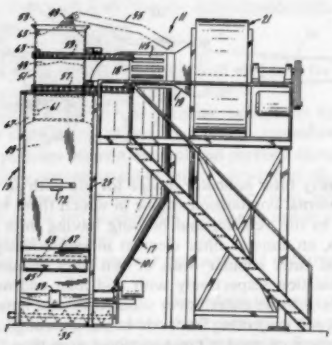
HEAT PRODUCING DEVICE

Stanley L. Bozdech, DeKalb, Ill.; Thomas E. Lipinski, Akron, Ohio; John W. Allen, Hudson; Stanley J. Ryba, Broadview Heights, both of Ohio; G. B. Kirby Meacham, Cohasset, Mass.; Charles Anthony, Jr., Livingston, N.J.; Dan L. Pattyn, Sycamore, and Frank Bauer, Wayne, both of Ill., assignors to DeKalb AgResearch, Inc., DeKalb, Ill.

Filed Mar. 13, 1978, Ser. No. 885,507

Int. Cl.[2] F23G *5/12*

U.S. Cl. 110—212 **8 Claims**



1. A heat producing device utilizing solid carbonaceous material, especially material of a cellulosic composition as fuel, said device including:

a gasifier for the carbonaceous material,

said gasifier having a gas outlet,

a burner supplied by said gas outlet,

a cyclonic burning chamber and particle separator connected to said burner,

said cyclonic burning chamber and particle separator having a heat outlet and a particle discharge outlet,

an adjustable air inlet and mixing chamber installed in said heat outlet for adding ambient air to reduce the temperature of the heat discharged from said heat outlet, and

a discharge fan having an inlet connected to said mixing chamber and an outlet for discharging the heat received therefrom.

4,162,656

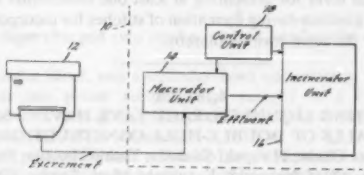
WASTE DISPOSAL BY INCINERATION

John A. Dallen, Port Clinton, Ohio, and Harry W. Green, Sarasota, Fla., assignors to The Standard Products Company, Cleveland, Ohio

Division of Ser. No. 738,531, Nov. 3, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,496

Int. Cl.[2] F23G *5/00*

U.S. Cl. 110—221 **11 Claims**



1. In a waste disposal system for disposing of excrement including an incinerator having a burner and a first fuel valve for supplying a minimum amount of fuel to said burner and a second fuel valve for supplying an additional amount of fuel to said burner, the method of disposing of excrement including the steps of:

converting the excrement to a substantially liquified effluent;

igniting said burner;

feeding effluent into said incinerator;

regulating said second fuel valve in response to the exhaust gas temperature to boil away the liquid in said effluent at a first average fuel-to-air mixture;

terminating the feeding of effluent into the incinerator;

and regulating said second fuel valve in response to the exhaust gas temperature after said liquid has been boiled away to incinerate the remaining waste material at a second lower average fuel-to-air mixture.

4,162,657

DEVICE FOR INSERTING ORNAMENTAL THREADS IN STITCHES OF SEAMS ON A SEWING MACHINE

Franco Prandini, Busto Arsizio, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jul. 31, 1978, Ser. No. 929,381

Claims priority, application Italy, Sep. 15, 1977, 27546 A/77

Int. Cl.[2] D05C *7/08*

U.S. Cl. 112—101 **6 Claims**

1. A device for inserting ornamental threads in stitches of seams formed on a sewing machine of the type having support framework including a base with a vertical column and an arm extending from the column for supporting the machine's needle bar having at least one needle carried thereby, the improvement comprising:

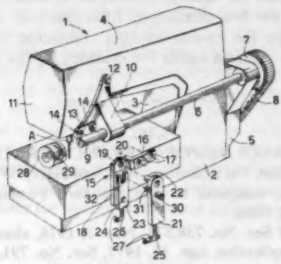
(a) a rotatably driven cam shaft journaled in spaced bearing brackets mounted on the machine and extending in a direction parallel with the arm;

(b) a control cam assembled on one end of said cam shaft adjacent the needle bar;

(c) a support plate attached to one of said bearing brackets;

(d) at least one thread guide lever pivotably mounted on said support plate which includes:

(i) a protruding finger defining a follower extending into operative association with said control cam for pivoting said thread guide lever to and fro in timed sequence with the stitching cycle; and



(ii) a thread guide attached to and movable with said thread guide lever for presenting at least one ornamental thread to a position during formation of stitches for incorporation into the seam formed thereby.

4,162,658

FLOATING LIQUID-STORAGE TANK HAVING SIDE WALLS OF DOUBLE-HULL CONSTRUCTION

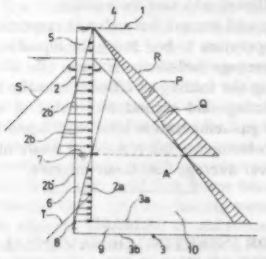
Toshimasa Okabe; Hiroyuki Shimada; Toshio Hanano; Naofumi Murao, all of Nagasaki; Kazuyoshi Mori, Tokyo; Hirohisa Tomikawa, Nagasaki; Akira Mizokami, Nagasaki; Yasuyuki Maehara, Nagasaki, and Masanori Shuku, Nagasaki, all of Japan, assignors to Mitsubishi Jukogo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1977, Ser. No. 850,372

Claims priority, application Japan, Nov. 25, 1976, 51/141456

Int. Cl.[2] B63B *25/08*

U.S. Cl. 114—74 A **2 Claims**



1. A floating liquid-storage tank having side walls of double-hull construction for storing a liquid lighter in specific gravity than water, characterized in that the double-hull side walls consist of inner and outer hull sections and have watertight partition plates for dividing the hollows of said side walls into non-communicated upper and lower ballast tanks, said outer hull sections of said upper ballast tanks being built to be resistant to the external water pressure, and those of said lower ballast tanks being non-pressure resistant, and holes in the outer hull sections of the lower ballast tank through which the water outside can have access to the lower tanks, said partition plates being horizontally located slightly below the level of the intersection of the liquid-pressure distribution line defined by the liquid pressure within the tank when the tank is fully loaded and the external-water-pressure distribution line defined by the outside water pressure in the direction of depth of the storage tank when the tank is in the full loaded condition.

4,162,659

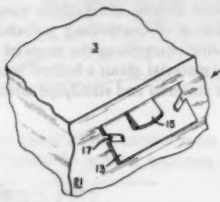
BOOKMARK

Richard M. Burke, Rte. 163, R.D. #3, Fort Plain, N.Y. 13339

Filed Oct. 18, 1978, Ser. No. 952,472

Int. Cl.[2] B42D *9/00*

U.S. Cl. 116—234 **5 Claims**



1. A bookmark for use with a book whose pages form an edge to underline and indicate a line or passage on a page selected by the reader; said bookmark being of integral, one-piece construction and comprising a flat body having a leg and tab; said flat body underlining and indicating said selected line or passage when said bookmark is disposed and inserted in said book, said tab being of tongue-like configuration and being defined by a surrounding slot, said leg and tab having a common bend or crease at which said leg depends from the plane of said flat body at an acute angle and from which said tab has an articulated free end depending from the plane of said flat body at a lesser angle, said depending leg having teeth for retentively engaging the edge of said book's pages to maintain said bookmark in the position where same has been disposed and said book has been closed, and said tab being manipulative by the reader to cam-open said closed book to the particular page on which said bookmark had been disposed and inserted by the reader's appropiately engaging said articulated free end of said tab between his thumb and index finger and twisting same to effect such cam-opening action.

4,162,660

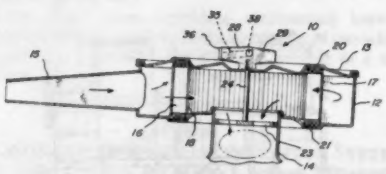
DIRTY AIR FILTER INDICATOR

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391, and Edward P. Christian, Lees Island, N. Twin Lake, Crystal, Minn. 55429

Filed Jun. 29, 1978, Ser. No. 920,179

Int. Cl.[2] B01D *35/00*; G01L *19/12*

U.S. Cl. 116—268 **3 Claims**



1. A dirty filter indicator device for use with an air cleaner for an internal combustion engine in which there is a housing secured to the vehicle, said housing having inlet and outlet openings, an annular filter element in said housing with the inner and outer annular walls of said filter element being in communication respectively with said inlet and outlet openings, a detachable outer cover secured to said housing, and a threaded rod projecting from said housing through an opening in said cover of greater cross-sectional area than that of said rod, said threaded rod being designed to have a nut secured thereto for clamping said outer cover in position against said housing:

said indicator device comprising a central portion having a threaded opening therein for threaded engagement with

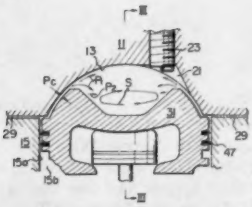
the threaded rod of the cleaner and having a base designed to engage in fluid tight relationship the outer wall of the detachable cover of the cleaner and having a recess in said base of larger cross-sectional area than the opening through the detachable cover and designed to overlie said opening, said indicator device having two laterally extending arms projecting from said central portion to provide means for readily tightening said indicator device on said threaded rod against said cover, said indicator device further having an inclined passage extending through at least part of one of said arms and said central portion, said passage communicating at its outer end with the atmosphere and at its inner end with said recess and being inclined downwardly from adjacent said central portion to the outer end thereof, and said indicator device having a ball disposed in said inclined passage, said ball normally resting in the outer lower portion of said passage but movable upwardly towards said central portion when the differential pressure thereacross increases as a result of the filter becoming dirty, at least a portion of the laterally extending arm in which said passage is located being transparent so that the position of the ball can be observed.

4,162,661

INTERNAL COMBUSTION ENGINE WITH COMBUSTION CHAMBERS WHICH CREATE A SQUISH AND SWIRL OF AN AIR-FUEL MIXTURE

Kiyoshi Nakanishi, and Takeshi Okumura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 22, 1977, Ser. No. 826,560
Claims priority, application Japan, Feb. 25, 1977, 52-021433
Int. Cl.[2] F02F *3/28*
U.S. Cl. 123—30 C **6 Claims**



1. An internal combustion engine with a combustion chamber, said engine comprising:

a cylinder;

a cylinder head having an inner wall defining the upper boundary of the combustion chamber;

a reciprocable piston in said cylinder, said piston having a circular top end and at least two raised circumferentially spaced portions thereon, each of said portions comprising:

a first radially outermost substantially part-spherical surface spaced a small distance from the inner wall when the piston is in the top dead center position to create a squish of an air-fuel mixture,

a radially innermost surface opposite said outermost surface, and

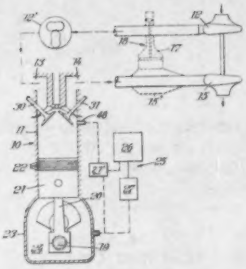
a concave surface at one circumferential end of each portion extending between the innermost and the outermost surfaces from the top to the bottom thereof, said concave surface extending at the lower end thereof at a relatively small gradient to the top end of the piston to produce mixture swirl flows in a direction perpendicular to the axis of the piston as it approaches its top dead center position.

4,162,662

TWO-STROKE INTERNAL COMBUSTION ENGINES

Jean Melchior, 66 Boulevard Maurice-Barrés, 9220 Neuilly-sur-Seine, France

Filed Jan. 13, 1977, Ser. No. 758,997
Claims priority, application France, Jan. 15, 1976, 76 00971
Int. Cl.[2] F02B *75/02, 77/00*
U.S. Cl. 123—65 VD **14 Claims**



1. A supercharged two stroke internal combustion engine, having:

a cylinder block and a cylinder head cooperating with at least one piston reciprocably received in a cylinder formed in said cylinder block to define at least one expansible combustion chamber,

at least one intake valve slidably received in said cylinder head and cooperating with an intake valve seat to control air flow from an intake pipe into said chamber,

at least one exhaust valve slidably received in said cylinder head and cooperating with an exhaust valve seat to control gas flow from said combustion chamber to an exhaust pipe,

and means for operating said intake and exhaust valves in proper time sequence with the displacement of said piston, whereby both said valves are open while the piston is at its bottom dead center,

said intake valve, intake pipe and cylinder head being so arranged and constructed to cause a progressively increasing non-uniform intake clearance opening oriented such that in response to opening movement of the said intake valve, the largest intake orifice area is developed at least initially closest to that portion of the wall of said cylinder must remote from said exhaust valve seat, so as to cause air to be directed toward the piston and substantially parallel to the wall of said cylinder upon opening of the intake valve and to thereby sheet-wise scavenge the chamber along a loop therein without substantial direct flow of air from the intake pipe to the exhaust pipe along the cylinder head.

4,162,663

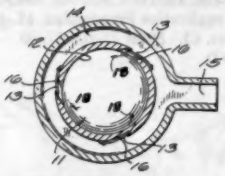
STRATIFIED CHARGE FOUR-STROKE ENGINE

Josef Ehrlich, Ashridge, Near Berkhemsted, England, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 20, 1977, Ser. No. 808,075
Claims priority, application United Kingdom, Jul. 5, 1976, 27910/76
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—75 B **4 Claims**

1. An internal combustion engine comprising a cylinder, a piston movable in said cylinder between top dead center and bottom dead center positions, a plurality of air entry ports located in the cylinder adjacently above said piston when said piston is at bottom dead center and adapted to be opened and closed in response to piston movement, said air entry ports being arranged around said cylinder in an angularly spaced series and extending generally tangentially from said cylinder so that air entering said cylinder through said ports swirls

within said cylinder, an air chamber extending at least partially circumferentially around said cylinder and communicating with a source of air and with said plurality of said air entry



ports, and a separate reed valve operatively associated with each of said ports for preventing flow from said cylinder to said air chamber and permitting flow into said cylinder from said air chamber.

4,162,664

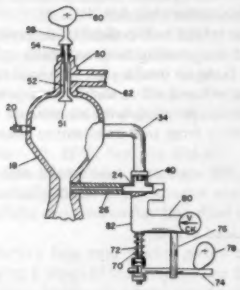
INTERNAL COMBUSTION ENGINE AND FUEL INTRODUCING MEANS THEREFOR

Maurice C. Fleming, 1013 23rd St. W., Bradenton, Fla. 33505

Continuation-in-part of Ser. No. 583,980, Jun. 5, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,639

Int. Cl.[2] F02B *75/04, 3/00*

U.S. Cl. 123—75 B **11 Claims**



1. In an internal combustion engine having a cylinder and a piston within the cylinder movable during a compression stroke to compress air in an upper portion of the cylinder, and the piston being driven down during a power stroke when the compressed air admixed fuel is ignited and is combusted, the improvement in means for fuel introduction and combustion thereof comprising:

(a) an enlarged precombustion chamber connected by a venturi passage to the upper portion of the cylinder so that during the compression stroke a part of the compressed air is forced through the venturi passage into the precombustion chamber, the precombustion chamber having an ignition means,

(b) a combustible fuel introducing means having a fuel chamber connected by a small opening to the venturi passage, valved means for conveying fuel to the fuel chamber from a fuel reservoir, said valved means disposing an increment of fuel from the fuel chamber to said opening when the gas pressure in the precombustion chamber is low so that on the compression stroke compressed air flowing through the venturi passage will induce a reduced pressure at the opening whereby to draw the increment of fuel into the venturi passage and cause it to be admixed with the passing air stream so as to provide a combustible air-fuel mixture in the precombustion chamber, and

(c) a by-pass conduit for conveying gases from the precombustion chamber to the fuel introducing means, a pressure transmitting means in the by-pass conduit to apply pressure from the gases therein to the fuel in said fuel chamber at a point spaced from the opening in the venturi passage, whereby when the ignition means ignites the combustible mixture in the precombustion chamber and causes combustion and a high gas pressure develops, a high velocity hot gas stream flows through the venturi passage into the upper portion of the cylinder thereby inducing a reduced pressure on another increment of fuel at said opening and concurrently gases under high pressure pass through the by-pass conduit to the pressure transmitting means so as to apply pressure to and thereby forcibly eject an increment of fuel through the opening into the high velocity hot gas stream in the venturi passage for thorough admixture therewith and to provide for ignition and a more complete and efficient combustion with the air in the upper portion of the cylinder, and thereby completing the power stroke of the piston.

4,162,665

MULTI-SPARK IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

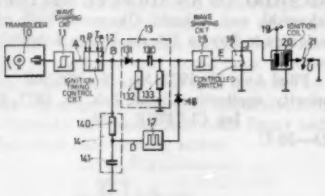
Günter Gräther, Pinache, and Friedrich Rabus, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,247

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623864

Int. Cl.[2] F02P *3/02*

U.S. Cl. 123—117 R **11 Claims**



1. In a sequential multiple spark pulse ignition system having an ignition coil (**20**) and at least one spark gap (**21**) connected to the secondary of the coil (**20**);

a controlled switch (**16**) connected to the primary of the coil and controlling current flow therethrough;

means (**10, 11. 12**) furnishing a signal (B) controlling generation of an ignition event;

and means to separately control the closing and opening of said controlled switch (**16**) for generation of the first spark pulse of said sequential multiple spark pulses and the next subsequent spark pulses comprising

a circuit stage (**13**) including a R/C function network connected to and controlling said controlled switch (**16**) to control supply of current to the coil to store energy for a first spark pulse;

a frequency generator (**17**) controlling repetitive opening and closing of the controlled switch (**16**) for an ignition event to generate said sequential spark pulses upon opening, after prior closing, of said controlled switch;

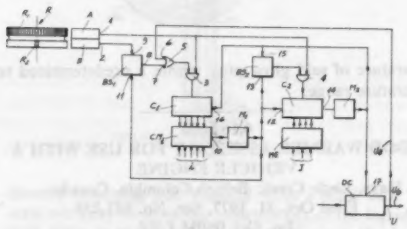
and a time delay circuit (**14**), serially connected to the frequency generator (**17**), the series circuit formed by the time delay circuit (**14**) and the frequency generator (**17**) being connected in parallel to the circuit stage (**13**), said circuit stage (**13**) providing a control pulse to the controlled switch (**16**) upon sensing an ignition event signal from said signal furnishing means (**10, 11, 12**) and said time delay circuit initiating a timing interval and after elapse thereof, controlling application of pulses from the frequency generator to the controlled switch (**16**).

4,162,666

SPARK ADVANCE APPARATUS FOR CONTROLLING THE IGNITION INSTANT OF A SPARK PLUG INDEPENDENT OF THE MAGNITUDE OF A POWER SOURCE IGNITING THE SPARK PLUG

Mauro Maioglio, Turin, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

Filed Jul. 25, 1977, Ser. No. 818,571
Claims priority, application Italy, Jul. 27, 1976, 25743 A/76
Int. Cl.[2] F02P 5/06
U.S. Cl. 123—117 D 11 Claims



1. An ignition timing apparatus for use in an internal combustion engine of the type having in combination a cylinder, a piston, a power source and a spark plug having a spark gap, said apparatus comprising:

(1) charge storage means for storing energy supplied by said power source at a rate determined by the magnitude of said power source;

(2) control means for:

(a) applying power generated by said power source to said charge storage means during a charge storage period beginning at a charge initiation instant and ending when the energy stored by said charge storage means reaches a predetermined level; and

(b) discharging the energy stored by said charge storage means across said spark gap of said spark plug immediately after the energy stored by said charge storage means reaches said predetermined level; and

(3) timing circut means for controlling said charge initiation instant in such a manner that said energy stored by said charge storage means is discharged across said spark gap at an instant which is determined by the speed of said engine and at least one other engine parameter but is independent of the magnitude of said power supply, said timing circuit means comprising:

(a) pulse generator means for generating a train of pulses having a frequency proportional to the speed of said engine;

(b) first counter means for counting the number of pulses generated by said pulse generator means during successive first and second time periods, said first time period corresponding to said charge storage period, said second time period beginning when said cylinder reaches its top dead center position and terminating when said first counter has counted a first predetermined number of pulses;

(c) second counter means for counting the number of pulses generated by said pulse generator means during a third time period beginning at the end of said second time period and ending when said second counter has counted a second predetermined number of pulses;

(d) count adjust means for varying the value of said second predetermined number of pulses as a function of said at least one engine parameter; and

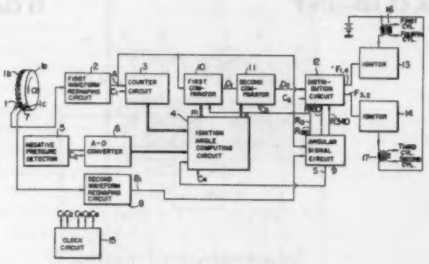
(e) means for causing said control means to apply said power source to said power generated by said charge storage means when said second counter means has counted said second predetermined number of pulses.

4,162,667

ELECTRONIC IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hisasi Kawai, Toyohashi, and Kazuo Iwase, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 10, 1978, Ser. No. 868,314
Claims priority, application Japan, Feb. 3, 1977, 52-10900
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 D 8 Claims



1. An electronic ignition timing control system for internal combustion engines comprising:

a rotational angle detector (1, 2) operatively coupled to the ring gear (1*a*) of the multicylinder engine for producing a rotational angle signal (a) each time one of a plurality of equi-spaced teeth (1*b*) provided on said ring gear is detected;

a reference angle detector (7, 8) operatively coupled to the ring gear of a multicylinder engine for producing a reference angle signal (B_1) each time a tooth (1*c*) provided on said ring gear is detected, said tooth being positioned to represent the reference position of one cylinder of said multicylinder engine;

a parameter detector (3, 5, 6) for detecting the operating parameter of said multicylinder engine;

an ignition angle computing circuit (4) connected to said parameter detector and including a memory in which a plurality of ignition angle data are memorized as ignition retard angles with respect to said reference angle position in correspondence with a plurality of parameter data, said ignition angle computing circuit proportionally interpolating two of said ignition angle data corresponding to adjacent two of parameter data one and the other of which are respectively larger and smaller than the output value of said condition detector;

an angular pulse circuit (9) connected to said rotational angle detector and said reference angle detector for counting the number of said rotational angle signal in response to said reference angle signal, said angular pulse circuit producing a first and second pulses (R_0, R_{180}) when the count valve thereof reaches predetermined first and second valves, respectively;

a comparison circuit (10, 11) connected to said rotational angle detector, said ignition angle computing circuit and said angular pulse circuit for comparing the number of rotational angle signal with the output value of said ignition angle computing circuit in response to said first and second pulses to thereby determine first and second ignition timings;

first ignition means (13, 16) for producing a high voltage in synchronism with said first ignition timing and simultaneously applying the high voltage to two cylinders of said multicylinder engine; and

second ignition means (14, 17) for producing another high voltage in synchronism with said ignition timing and simultaneously applying the high voltage to other two cylinders of said multicylinder engine.

4,162,668

DIESEL INTERNAL COMBUSTION ENGINE

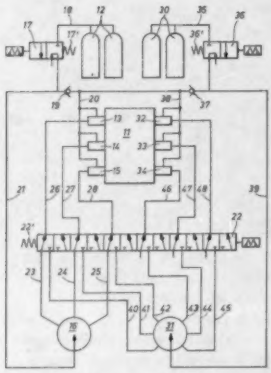
Karl Jacob, Friedrichshafen; Franz Edmaier, Markdorf; Robert Schulmeister, and Stefan Walz, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,186

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632015

Int. Cl.[2] F02N *17/00;* **F02B** *33/00;* **F02M** *23/04*

U.S. Cl. 123—179 F **11 Claims**



1. A multi-cylinder diesel internal combustion engine with a supercharger means and a charging air starting means including a starting air reservior means, and means for selectively communicating said starting air reservoir means with at least some air inlet valves associated with cylinders of the engine during a starting operation of the engine, the improvement comprising:

an additional air reservoir means for storing a quantity of supplemental charging air,

means for selectively communicating said additional air reservoir means with the air inlet valves during at least one of an acceleration of the engine and a sudden loading of the engine,

the air inlet valves include a first set of air inlet valves and a second set of air inlet valves, and

wherein said starting air reservoir means selectively communicates with only said first set of air inlet valves and said additional air reservoir means selectively communicates with both said first and second sets of air inlet valves.

4,162,669

IGNITION SYSTEM FOR ROTARY PISTON ENGINES

Toshihiko Igashira, Toyokawa; Shunzo Yamaguchi, Okazaki; Hisasi Kawai, Toyohashi; Seiji Morino, and Naoki Umeda, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 2, 1978, Ser. No. 874,483

Claims priority, application Japan, Feb. 22, 1977, 52-18953; Feb. 23, 1977, 52-19607

Int. Cl.[2] F02B *53/12;* **F02P** *19/02*

U.S. Cl. 123—210 **5 Claims**

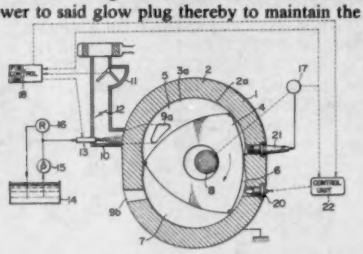
1. An ignition system for a rotary piston engine comprising:

a glow plug mounted in an epitrochoidal housing of an engine on the leading side of the trochoidal minor axis of said housing in the direction of rotation of a rotor;

engine speed detecting means for detecting the rotational speed of said engine;

parameter detecting means for detecting the amount of fuel supply to said engine or an engine operating parameter related to said amount of fuel supply; and

an ignition control circuit connected to said engine speed detecting means and said parameter detecting means and responsive to the signals therefrom to control the supply of power to said glow plug thereby to maintain the temperature of said glow plug within a predetermined temperature range.



4,162,670

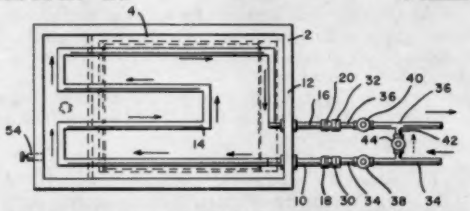
FOOD WARMER ASSEMBLY FOR USE WITH A VEHICLE ENGINE

Victor Hays, Eagle Creek, British Columbia, Canada

Filed Oct. 31, 1977, Ser. No. 847,239

Int. Cl.[2] B60H *1/04*

U.S. Cl. 126—19.5 **8 Claims**



1. A food warmer assembly for use with a vehicle engine, said assembly comprising a chest having a compartment therein and including a removable top means, retaining means disposed in said compartment for support of foodstuffs, a first supply conduit extending through a wall of said chest, a heating conduit disposed in said compartment and connected to said first supply conduit, a first return conduit extending through a wall of said chest, said first return conduit being connected to said heating conduit, said first supply and return conduits having at their ends respectively a supply coupling first portion and a return coupling first portion adapted for connection respectively to a supply coupling second portion and a return coupling second portion, a second supply conduit having a first end connected to a source for engine coolant and a second end having said supply coupling second portion thereon, a second return conduit having a first end connected to said source for engine coolant and a second end having said return coupling second portion thereon, a supply valve disposed in said second supply conduit proximate said supply coupling second portion and a return valve disposed in said second return conduit proximate said return coupling second portion, a bypass conduit extending from said second supply conduit to said second return conduit, and a bypass valve disposed in said bypass conduit, said bypass conduit being disposed between said source and said supply and return valves.

4,162,671

SOLAR ENERGY PANEL AND MEDIUM FOR USE THEREIN

Donald Christy, 1005 Washington, Scott City, Kans. 67871

Filed Aug. 15, 1977, Ser. No. 824,269

Int. Cl.[2] F24H *7/00;* **F24J** *3/02*

U.S. Cl. 126—400 **11 Claims**

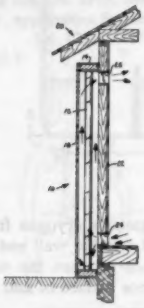
1. A method of storing solar energy comprising the steps of:

providing a liquid container;

placing in said container an organic material having a rela-

tively high heat of fusion and a melting point of between 50° F. and 168° F. and selected from the group consisting of C_{15} to C_{36} paraffinic hydrocarbons and C_8 to C_{14} aromatic hydrocarbons; and

exposing said material in said container to the sunlight



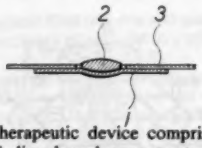
thereby changing said material from a solid to a liquid state whereby to store the solar energy in the liquid until such time as the liquid solidifies releasing the heat of fusion.

4,162,672

MAGNETO-THERAPEUTIC DEVICE

Seiichi Yazaki, Nara, Japan, assignor to Fujimoto Company, Limited, Osaka, Japan

Filed Feb. 2, 1978, Ser. No. 874,645
Int. Cl.² A61N *1/42*
U.S. Cl. 128—1.3 **3 Claims**



1. A magneto-therapeutic device comprising an adhesive base sheet, a hard disc-shaped permanent magnet of ferrite having a convex top face, a diameter of about 5 mm and a thickness at its center of about 2.5 mm and having a magnetic field of 500 to 1,000 oersteds in intensity and adhered to the base sheet in the center of its adhesive face, and a release sheet affixed to the adhesive face of the base sheet except the center portion thereof.

4,162,673

METHOD OF TESTING THE POSITION OF A NEEDLE ASSEMBLY IN THE EPIDURAL SPACE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 680,959, Apr. 28, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,478
Int. Cl.² A61B *5/00*
U.S. Cl. 128—748 **3 Claims**

1. A method of testing the position of a needle assembly in the epidural space of a patient's body, the assembly having a tip and an elongated passageway communicating between the tip and a shallow open cavity, comprising the steps of:

positioning the tip and a distal passageway portion of the assembly inside the patient's body with the tip located adjacent the epidural space and with the cavity located outside the patient's body in an upright position;

placing a testing liquid in the upright cavity of the assembly; and

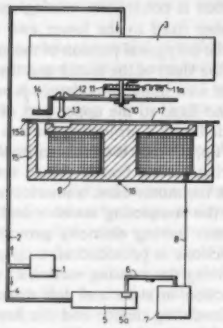
advancing the assembly into the body while determining whether the testing liquid passes from the cavity to the passageway or the exterior of the needle assembly to ascertain the position of the needle assembly tip in the patient's body.

4,162,674

INSTRUMENT FOR RECORDING BLOOD PRESSURE

Johann Klein, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1977, Ser. No. 857,962
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657612
Int. Cl.² A61B *5/02*; G01D *5/06*
U.S. Cl. 128—680 **7 Claims**



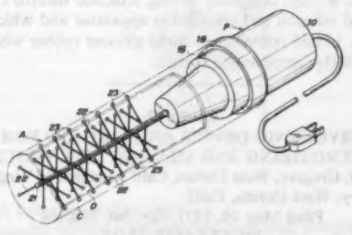
1. A blood pressure recording instrument for displaying pulse pressure values of a patient, comprising a sleeve for detecting the pulse pressure values, a sound transducer connected to the sleeve, an electric monitoring unit cooperative with the transducer for feeding the detected values on to a card, a pressure gauge having a movable needle which is mounted so as to be adjustable in relation to the record card by means of the monitoring unit and a pump connected to the sleeve and the pressure gauge, wherein the electric monitoring unit has an electromagnet which is installed in stationary manner in the recording instrument, the record card is arranged directly above the pole faces of the electro-magnet and a pole piece composed of magnetisable material is provided on or near to the needle.

4,162,675

WHOLE BODY SPECIFIED AREA STIMULATING THERAPY DEVICE

Sooji Kawada, No. 49-6, 5-Chome, Nakano, Nakano-ku, Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,754
Claims priority, application Japan, Oct. 4, 1976, 51-119145
Int. Cl.² A61H *23/00*
U.S. Cl. 128—55 **4 Claims**



1. A whole body specified area stimulating therapy device comprising a power drive unit, a body specified area stimulating device, and a head specified area stimulating device; said power drive unit is formed by mounting a motor in a motor case, a shaft of the motor is extended upward to provide a polygonal portion at the tip thereof, and a male thread is formed on the outer periphery of the upper part of the motor case; the body specified area stimulating device is provided on

the upper part of a case which is fitted and fixed to the upper part of the motor case, the case is connected to the motor case by a connecting ring provided with a female thread screwing with the male thread of the motor case, a large number of thin bars having elasticity are fixed to an operating shaft which is extended upward of the outside of the case from the inside of the case, beating members like balls are mounted on the tips of the thin bars, a transparent cover having an opening portion can be mounted on a case surrounding according to necessity in such a way that it covers the beating members, and the connecting member fixed to the lower end of the operating shaft is fitted to the polygonal portion of the shaft of the motor so as to connect the shaft of the motor and the operating shaft; the head specified area stimulating device js provided in a case which is fitted and fixed to the upper part of the motor case, the case is provided with a projecting portion having an opening portion at its tip, the case is connected to the motor case by the connecting ring having female thread screwing the male thread formed on the motor case, is interlocked with the shaft of the motor by the connecting member and a specified area stimulating member having elasticity provided with a large number of projections is provided at a tip portion of a rod means for converting the rotating motion of the motor to the reciprocating motion in right and left directions; the body specified area stimulating device and the head specified area stimulating device are interchangeably mounted on the power drive unit to be used for therapy.

4,162,676

BLOOD BAG HAVING CO_2 ABSORBENT THEREIN

Thomas D. Talcott, Santa Barbara, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 712,106, Aug. 5, 1976, Pat. No. 4,082,509. This application Aug. 4, 1977, Ser. No. 821,668

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—214 D **3 Claims**

1. A blood storage system which comprises

a blood storage container having attached thereto conventional infusion and transfusion apparatus and which contains, in said container, a cured silicone rubber which has $Ca(OH)_2$ compounded therein.

4,162,677

CRYOGENIC DEVICE AND METHOD FOR NECROTIZING AND SHAVING LIVE TISSUE

Harold D. Gregory, West Covina, Calif., assignor to Virginia M. Gregory, West Covina, Calif.

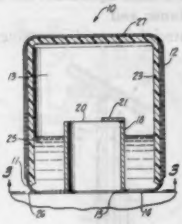
Filed May 19, 1977, Ser. No. 798,364

Int. Cl.[2] A61B *17/36*

U.S. Cl. 128—303.1 **16 Claims**

1. A cryogenic device for treating skin and/or live tissue cryogenically comprising:

means providing a hollow storage chamber for liquid cryogen having a cryogen storing portion thereof heat insulated and adapted to store a cryogen charge when said device is not in use and having a metallic wall thereof adapted to be flooded on its interior with liquid cryogen while the exterior surface of said metallic wall is held in close heat exchange relation to tissue to be cooled; and



means for conducting gaseous cryogen from said storage chamber through said metallic wall and discharging the same past the interface between the tissue undergoing cooling and said exterior surface of said metallic wall.

4,162,678

SURGICAL APPARATUS FOR SIMULTANEOUS RESECTION OF SOFT TISSUES AND THEIR SUTURING WITH METAL STAPLES

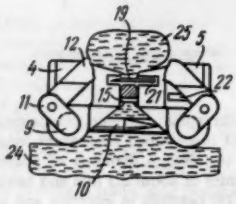
Vladimir M. Fedotov; Boris A. Smirnov; Valery V. Revo, and Sergei N. Lapchenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki, U.S.S.R.

Filed Oct. 13, 1977, Ser. No. 843,706

Claims priority, application U.S.S.R., Dec. 17, 1976, 2430153

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—305 **2 Claims**



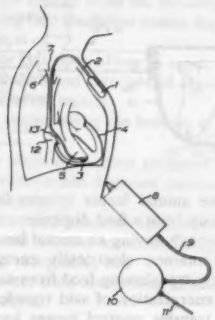
1. A surgical apparatus for the simultaneous resection of soft tissues and their suturing with metal staples, comprising: an elongated anvil branch; an elongated staple branch hinge-connected with said anvil branch; a jaw on each said branch; the jaw of the anvil branch being situated opposite the jaw of the staple branch; said anvil branch being provided with a longitudinal row of grooves for clinching the ends of staples; said staple branch having slots for the staples situated opposite said grooves, and a longitudinal slot; staple tappets housed in said staple slots; a plank situated in said longitudinal slot of the staple branch and movable therealong; a wedge bevel at the end of said plank, facing the jaw and intended for interacting with said staple tappets when ejecting the staples; a clamp for locking the branches in a position when they are drawn together up to the suturing clearance; two rotation shafts, each of which is set along one of said branches; needles for grasping soft tissue, secured on said rotation shafts substantially perpendicularly to the latter; cranks rigidly secured on said rotation shafts so that upon drawing the branches together the rotation of said shafts with the needles towards each other is ensured, resulting in the areas of soft tissue grasped by the needles being forced into the clearance between the branches, with the formation of a roll of soft tissue intended for excision; a blade for excising said roll of soft tissue situated in said staple branch, longitudinally movable together with said plank.

4,162,679

METHOD AND DEVICE FOR THE IMPLANTATION OF ONE OR MORE PACEMAKER ELECTRODES IN A HEART

Erik G. B. Reenstierna, Borgeby 11, 230 50 Bjärred, Sweden

Filed Sep. 28, 1977, Ser. No. 837,476
Claims priority, application Sweden, Sep. 28, 1976, 7610696
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—419 P 6 Claims



1. A method of transvenously implanting at least one pacemaker electrode in a heart with said electrode electrically connectible, by means of an electric line, to said pacemaker for transferring stimulation pulses to the heart, comprising the steps of

inserting the electrode which is connected to a body of material actuable by a magnetic field of force in a selected vein,

applying a magnetic field of force and guiding said electrode and connected body of material to a selected region of the heart,

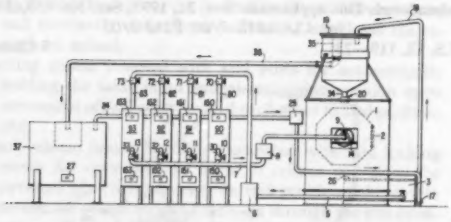
applying and holding a permanent magnet to the body of the patient to maintain said electode and connected body of material in contact with the selected region of the heart for the period of time required for growth of body tissue which will maintain electrode positioning.

4,162,680

NON-POLLUTING SYSTEM FOR METAL SURFACE TREATMENTS

Lester Coch, Northport, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Division of Ser. No. 694,830, Jun. 10, 1976, Pat. No. 4,062,990.
This application Sep. 8, 1977, Ser. No. 831,691
Int. Cl.[2] B05C 3/08
U.S. Cl. 118—76 1 Claim



1. Apparatus for the mechanical impact plating of metal parts with impacting media comprising:

a rotary plating barrel having an opening for introducing into said barrel: parts to be plated, plating material and impacting media;

a hopper disposed above said rotary barrel for receiving impacting media and including an outlet which can be aligned with said barrel opening when said opening is rotated upwardly, so that said impacting media can be deposited into said barrel;

a bin disposed below said barrel for receiving liquid and impacting media discharged from said barrel opening when said opening is rotated downwardly;

a water storage tank;

means fluidly connecting said hopper with an inlet of said water storage tank to conduct water from said hopper to said storage tank;

means fluidly connecting an outlet of said water storage tank with said hopper and including an eductor communicating with an impacting media outlet of said bin to receive and conduct said impacting media from said bin to said hopper;

a plurality of storage container means, each having an inlet and an outlet;

first conduit means connected between a liquid outlet of said bin and said inlets of said storage container means;

first selectively actuable valve means connected to said first conduit means to direct fluid from said bin selectively to the inlets of said container means so that liquid from said plating barrel which is discharged into said bin can be stored in a selected one of said storage container means;

second conduit means, separate from said first conduit means and connected between the outlets of said container means and an inlet of said barrel for conducting liquid from said storage container means to said barrel;

second selectively actuable valve means connected to said second conduit means to direct liquid selectively from said storage container means to said barrel so that the liquid from a previous cycle can be re-used in a subsequent cycle;

third conduit means for adding make-up liquid to said barrel; and

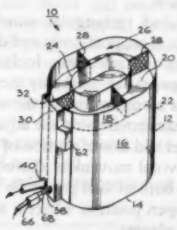
said storage means each including a port located at a lower end thereof to enable precipitated sludge to be removed from said container means.

4,162,681

FISH-BAIT TANK

David L. Patterson, 18951 Walnut St., Fountain Valley, Calif. 92708

Filed Jan. 30, 1978, Ser. No. 873,354
Int. Cl.[2] A01K 61/00
U.S. Cl. 119—3 8 Claims



1. A bait tank comprising:

a housing having a perimetrical side wall integrated with a bottom wall, said side wall having inner and outer surfaces and top and bottom ends;

a fluid intake head provided with intake port means and a fluid discharge head provided with discharge port means, with each of said intake and discharge heads being integrated with the outer surface of said side wall, said intake and discharge heads having elongated configurations and being substantially vertically and adjacently disposed with

the height of each of the intake and discharge heads being about the same as the height of the side wall;

intake aperture means traversing said side wall and disposed within the perimeter of said intake head for extending fluid communication from said intake head to the interior of said housing, said intake aperture means comprising a plurality of vertically spaced orifices;

discharge aperture means traversing said side wall and disposed within the perimeter of said discharge head for extending fluid communication from the interior of said housing to said discharge head; and

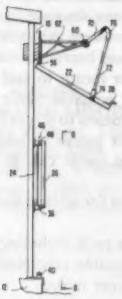
level control means cooperating with said discharge aperture means for selectively controlling fluid level in said housing.

4,162,682

PIVOTAL SECTIONALIZED WALL FOR HOG RAISING ENCLOSURE

Wayne K. Miller, deceased, late of Ord, Nebr., and by Sharon Miller, executrix, 418 S. 17th. St., Ord, Nebr. 68862

Filed Jan. 25, 1978, Ser. No. 872,107
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—16 **10 Claims**



1. A sectionalized pivotal wall construction for an animal raising enclosure having a foundation, spaced vertical support posts, a horizontal roof support resting thereon, and a roof, said wall comprising:

a first elongated rectangular panel extending between adjacent vertical support posts adjacent the foundation; first releasable locking means carried by said first panel for normally connecting each lower corner of said first panel to the enclosure;

a second elongated rectangular panel extending between adjacent vertical support posts and disposed adjacent said first panel; second releasable locking means carried by said second panel for normally connecting each upper corner of said second panel to the adjacent support post; first hinge means connecting the adjacent upper portion of said first panel and lower portion of said second panel for permitting pivotal movement thereof from a closed position wherein both of said panels lie in a common vertical plane to an open position wherein said panels lie in adjacent vertical planes;

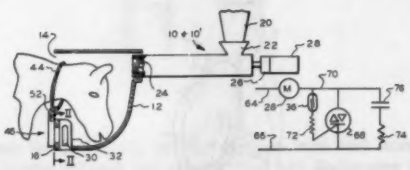
a third elongated rectangular panel extending horizontally between adjacent vertical support posts and vertically between said second panel and the roof supports; second hinge means connecting the upper portion of said panel to the roof support for permitting pivotal movement thereof from a closed position wherein said third panel lies in the vertical plane containing said first and second panels to an open position wherein said third panel lies in a plane disposed at an angle to the vertical; and drive means carried by said structure for moving said third panel from a closed to an open position.

4,162,683

ANIMAL FEEDER USING MAGNETICALLY BIASED SWITCH

Cletus A. Brooks, Onsted, Mich., assignor to Selective Feeder Company, Onsted, Mich.

Filed Jun. 21, 1977, Ser. No. 808,992
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51 R **10 Claims**



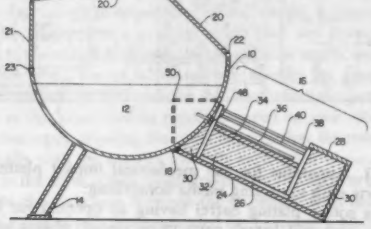
1. A selective animal feeder system for feeding selected animals of a group from a feed dispenser comprising in combination, a feed trough having an animal head access opening, a feed storage container, electrically energized feed transfer means selectively transferring feed from said container to said trough during energization of said transfer means, proximity operated feed transfer control means located adjacent said head access opening controlling operation of said feed transfer means, said control means including an electric switch operable by the influence of magnetic field forces between open and closed conditions located adjacent said access opening, a permanent biasing magnet adjacent said access opening and switch operably related to and biasing said switch having first and second poles of opposite polarity in spaced relation, the poles of said biasing magnet being related to said access opening in a predetermined manner, a second permanent magnet having first and second poles of opposite polarity in a spaced relation substantially corresponding to the spaced relation of the poles of said biasing magnet and adapted to be worn by the animal to be fed and oriented on the animal in a predetermined manner whereby said poles of said second magnet will be oriented to said access opening and biasing magnet in a predetermined manner upon the animal inserting its head within said opening, said switch being selectively operated to said open and closed conditions upon the animal inserting its head within said opening to locate said second magnet within the magnetic field of said biasing magnet in dependence upon the relationship of the polarity of the poles of said magnets.

4,162,684

SOLAR ICE MELTER FOR USE AT LOW AMBIENT TEMPERATURES

Charles C. Loveless, Jr., 1508 W. 8th St., Roswell, N. Mex. 88201

Continuation-in-part of Ser. No. 840,312, Oct. 7, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,650
Int. Cl.[2] A01K *7/00*; F24J *3/02*
U.S. Cl. 119—73 **5 Claims**



1. A device for watering animals from a suitable water re-

ceptacle adapted for use at low ambient air temperatures at which the water in the receptacle is at least partially frozen, comprising:

an open receptacle containing ice;

a solar energy collector rigidly fixed to said receptacle and disposed to transmit heat into the ice contained in said receptacle, wherein said receptacle and said solar energy collector are oriented to face in a substantially southeasterly direction and at an angle above the horizontal so as to receive maximum energy from the morning sun;

an outer shell having first insulation means disposed inside its peripheral walls;

a wooden collector box open along its upper face, disposed inside said outer shell and surrounded about its periphery by said first insulation means;

second insulation means lining the bottom of said collector box;

a heat-conducting absorber surface prepared to absorb impinging solar radiation and disposed sunward of said second insulation means;

a heat pipe affixed to said absorber surface so as to receive heat therefrom and dispose to conduct heat into the ice contained in said receptacle; and

a cover over said outer shell comprising at least one sheet of a transparent material.

4,162,685

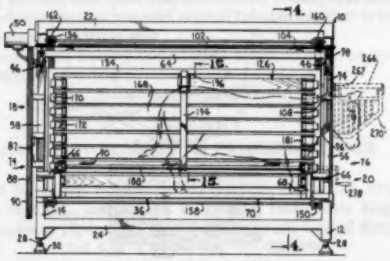
BOVINE SURGICAL TABLE

George E. Knappenberger, P.O. Box 277, Haven, Kans. 67543

Filed Jan. 4, 1977, Ser. No. 756,791

Int. Cl.[2] A61D *3/00*

U.S. Cl. 119—103 **18 Claims**



1. In a surgical table:

an animal-receiving cage having opposed, entrance and exit openings;

a pair of side-by-side stanchion posts at said exit opening, each of said posts having opposed, upper and lower ends;

means mounting said posts for movement inwardly toward each other to capture the neck of an animal therebetween, and outwardly away from each other to release the restrained animal;

locking means coupled with said posts for automatically holding the same in an animal-restraining position upon movement of said posts toward each other to said position; and

quick-release means operably associated with said locking means for operating the latter to release said posts for outward movement away from said position, whereby to permit the animal to leave the cage through the exit opening,

said locking means including locking components on said lower ends of the posts, a transversely extending holding bar selectively engageable with said components at any of a number of spacings between said lower ends of the posts to set the width of the exit opening at the bottom thereof, a transversely extending, toothed member adjacent said upper ends of the posts, and locking dogs on said upper ends engaging said member as said posts move inwardly toward each other to said animal-restraining position.

4,162,686

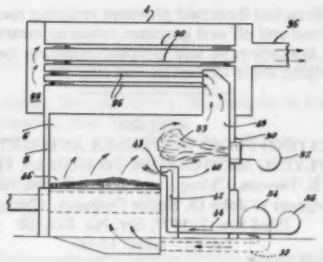
INDUSTRIAL BOILER UTILIZING MULTIPLE FUELS AND HAVING REDUCED PARTICULATE EMISSION AND METHOD OF COMBUSTION

Harold B. Infield, Garfield Heights, Ohio; Albert Morrison, III, Landisville, and William A. Tauskey, Sr., Bradford Woods, both of Pa., assignors to North American Manufacturing Company, Cleveland, Ohio; Burnham Corporation, Irvington, N.Y. and Combustion Service and Equipment Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1977, Ser. No. 842,467

Int. Cl.[2] F23C *1/02*; F22B *7/12*

U.S. Cl. 122—149 **10 Claims**



1. A boiler adapted to burn coal with reduced particulate emission, said boiler including

a combustion chamber and a fire-tube section, said combustion chamber being positioned below said fire-tube section and having a flue gas exit at one end thereof to discharge hot combustion gases from said combustion chamber,

said combustion chamber including a coal-burning area and a combustion gas passage from said coal-burning area to said flue gas exit,

said coal-burning area being beneath a major portion of said fire-tube section but not directly beneath said flue gas exit, whereby passage of coal combustion gases from said coal-burning area through said combustion gas passage is at an angle from the vertical,

said combustion chamber further including an oil or gas burner removed from said coal-burning area positioned at the opposite end of said combustion chamber from said coal-burning area and below and proximate to said flue gas exit, said burner being directed so that its flame extends horizontally through said combustion gas passage toward the end of the combustion chamber having said coal-burning area, past said flue gas exit, across the path of said coal combustion gases, whereby the direction of the flame from said burner opposes the direction of flow of said coal combustion gases and particulate emission resulting from burning of coal, and

means for varying the relative quantities of coal and oil or gas being burned.

4,162,687

DENTAL FLOSSING DEVICE

Leonard G. Lorch, 1352 Emerson St., Palo Alto, Calif. 94301

Filed Jun. 6, 1978, Ser. No. 912,951

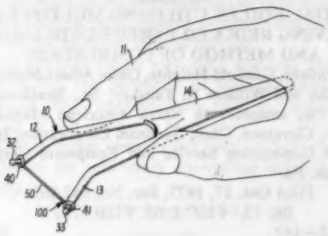
Int. Cl.[2] A61C *15/00*

U.S. Cl. 132—91 **6 Claims**

1. A device for flossing teeth comprising:

a handle with a paid of resilient arms extending therefrom, each of said arms having a finger extending therefrom, the longitudinal axes of said fingers forming an angle of between 30° and 180° with each other;

grommet retaining means carried by each arm;
a length of flossing material; and
a pair of grommets connected to the ends of said flossing material, such that said grommets are readily attached to



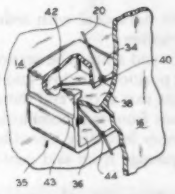
and detached from said grommet retaining means by sliding onto and off said grommet retaining means and being held in position on said grommet retaining means by the diverging angle formed by said fingers.

4,162,688

MEDICATING FLOSS DISPENSER AND METHOD OF APPLYING MEDICATION TO HUMAN TEETH

Emanuel B. Tarrson, Chicago, and Stevan Tisma, Niles, both of Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Sep. 7, 1977, Ser. No. 831,150
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—92 A **7 Claims**



1. A medicating dental floss dispenser comprising a holder having a bobbin rotatably mounted therein, a medicine chamber located in said holder and positioned adjacent said bobbin, said medicine chamber including a plurality of bearing surfaces which are distributed throughout said chamber to cause the floss to follow a relatively long path through the medicine chamber, said bearing surfaces alternately squeezing and relaxing said floss without disturbing the lay of the fibers so that the floss becomes saturated with the medicine while it moves through said chamber, means for drawing said floss from said bobbin, through said medicine chamber, and out a port in said holder and means for maintaining a back tension in said floss while it travels from said bobbin, through said holder, and to the outside of said holder.

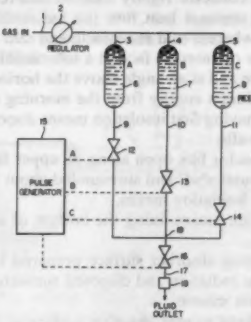
4,162,689

TIME DIVISION FLOW CONTROL

Joseph J. Zdrodowski, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 14, 1977, Ser. No. 815,469
Int. Cl.[2] G01F *11/00*
U.S. Cl. 137—266 **10 Claims**

1. A time division fluid flow system comprising in combination:
(A) one or more fluid stream inlet means, each fluid stream inlet means providing a fluid stream,
(B) pulse generator means;
(C) one or more pulse valve means, wherein one said pulse valve means is in operative relationship to one of said fluid stream inlet means, said pulse valve means being under control of said pulse generator means as to their respective duty cycles whereby a final fluid stream derived from the aforesaid fluid stream is provided under time division flow



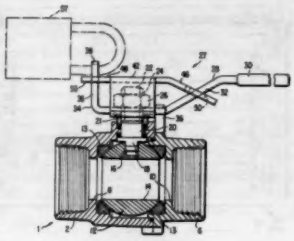
control when the repetition period of said pulse valve means is less than one second and the sum of the duty cycles of said pulse valves is less than the repetition period.

4,162,690

VALVE LOCKING DEVICE

Carl S. Anderson, Worcester, Mass., assignor to Jamesbury Corp., Worcester, Mass.

Filed Nov. 18, 1977, Ser. No. 852,837
Int. Cl.[2] F16K *35/06*
U.S. Cl. 137—385 **9 Claims**



1. A locking device for a rotary valve having a stem assembly for rotation of said valve between an open or closed position, which comprises:
a handle assembly adapted to be connected to said stem assembly for rotation of said valve, and having a handgrip portion at a first end thereof and a securing member at a second end thereof;
locking means mounted on said handle assembly at a position spaced from said securing member so as to interfittingly cooperate with said handle assembly securing member and adapted to cooperate with an abutment means mounted on said housing to secure said valve handle in both the valve open position and the valve closed position.

4,162,691

TUBULAR VALVE DEVICE

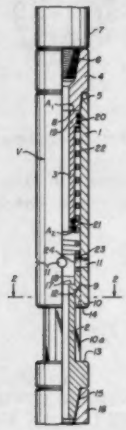
Lee E. Perkins, Houma, La., assignor to Kajan Specialty Co., Inc., Houma, La.

Filed Sep. 19, 1977, Ser. No. 834,283
Int. Cl.[2] F16K *11/10*
U.S. Cl. 137—613 **13 Claims**

1. Valve apparatus comprising:
a first tubular member;

a second tubular member telescopically engaging said first tubular member for axial movement between a retracted position and an extended position, said first and second tubular members forming a flow passage through which fluid communication may be established between opposite ends of said apparatus;

port means through the walls of one of said tubular members by which fluid communication may be established between said flow passage and the exterior of said apparatus;



closure means carried by one of said tubular members for selectively opening and closing said port means to permit or prevent said fluid communication with the exterior of said apparatus when said second tubular member is in said extended position; and

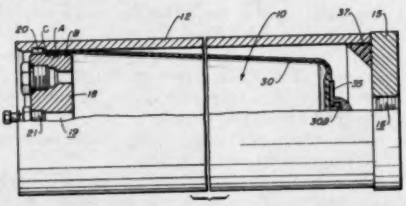
biasing means biasing said closure means toward an opened position.

4,162,692

HYDRO-PNEUMATIC FLEXIBLE BLADDER ACCUMULATOR

Edward M. Greer, Beverly Hills; Frank S. Wyle, Los Angeles, both of Calif., and Martin R. Packer, Handforth, England, assignors to Hydrotrole Limited, Stockport, United Kingdom

Filed Sep. 7, 1976, Ser. No. 720,886
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **4 Claims**



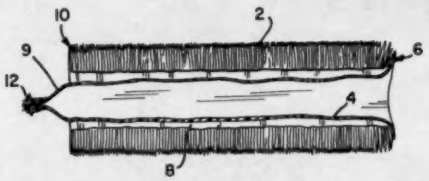
1. A hydro-pneumatic accumulator comprising: an elongated tube open at both ends and having a peripheral groove on the inner surface thereof adjacent to one of said ends; a closure cap mounted within said one end of said tube having a gas port extending therethrough, said closure cap having an inner end spaced radially inwardly from the inner surface of said tube to form a mounting means, said mounting means having a pair of axially spaced peripheral grooves formed thereon; a flat disc-shaped plate affixed to said other end of said tube and having a liquid port extending therethrough; a spacer ring formed of deformable material mounted at said other end of said tube engaging the inner surface of said tube and the inner surface of said plate; a thimble-shaped bladder of a resilient, deformable material mounted in said tube with its mouth extending over said mounting means in resilient engagement therewith, said bladder having an internal integral sealing bead surrounding the rim of its mouth to be compressibly received in the inner one of said grooves, and an integral anchoring bead surrounding its mouth axially displaced inwardly from the sealing bead to be received in the outer one of said grooves; and a removable snap ring received in the peripheral groove extending around the inner surface of said tube at said one end thereof for retaining the closure cap in said one end of said shell, said sealing bead having essentially the shape of an O-ring, said anchoring bead having a triangular shape, the inner one of said grooves on said mounting means which receives said sealing bead having a rectangular configuration, and the outer one of said grooves on said mounting means which receives said anchoring bead having a complementary triangular shape.

4,162,693

REVERSIBLE SHIRRED CASING AND METHOD FOR PRODUCING IT

John H. Beckman, Downers Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 17, 1978, Ser. No. 870,198
Int. Cl.² A22C *13/00*
U.S. Cl. 138—118.1 **15 Claims**



1. A shirred tubular casing having a portion of a first end of the casing deshirred and disposed within the bore of the casing with the deshirred casing extending to the vicinity of a second end of the shirred tubular casing, said deshirred casing proximal the second end of the shirred casing being gathered and closed by closure means disposed external of the deshirred casing such that the inner deshirred casing has an open end which is integral with the first end of the shirred tubular casing and a closed end at the second end of the shirred tubular casing, said closed end comprising closure means disposed outside of the deshirred casing so that material fed into the open end of the inner deshirred casing down to its second end will not contact the closure means employed for closing the end of the deshirred casing and when the material is continuously fed into the open end through the shirred tubular casing and out the closed end of the shirred casing, the shirred casing will turn inside out so that the external surface of the shirred casing will contact the material fed into the casing.

4,162,694

METHOD FOR AMELIORATING HAZARDOUS CONDITIONS ASSOCIATED WITH CONTAINERS WHICH CONTAIN VAPORS OF COMBUSTIBLE LIQUID

Oscar D. Caldwell, 2420 SW. 32nd, Oklahoma City, Okla. 73119

Filed Jul. 15, 1977, Ser. No. 815,916
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 **8 Claims**

1. A method for ameliorating the hazardous conditions associated with containers which contain, within an interior thereof, vapors of combustible liquids, comprising the steps of:

introducing an oxygen-depleted gas into the interior of the container, comprising the steps of:

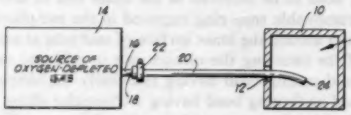
providing a source of the oxygen-depleted gas;

establishing fluid communication between the source of

the oxygen-depleted gas and the interior of the container; and

passing the oxygen-depleted gas from the source into the interior or the container;

permitting the oxygen-depleted gas and vapors of combustible liquids to escape from the container; and



maintaining the introducing of oxygen-depleted gas and the permitting of the oxygen-depleted gas and the vapors of the combustible liquids to escape from the container for a period of time sufficient to render the environment about the container relatively safe for blacksmithing operations.

4,162,695

HANDBAG WITH THERMAL THEFT PROTECTION SYSTEM

Lawrence L. Moses, 3728 Cherrywood Ave., Los Angeles, Calif. 90018

Filed Jul. 28, 1978, Ser. No. 928,740

Int. Cl.[2] A45C *1/08*

U.S. Cl. 150—35 **6 Claims**

1. A handbag with theft protection device comprising:

a bag portion having an opening for access thereto;

a carrying strap attached to said bag portion;

a source of electrical current;

a heating means to heat the outer surface of said handbag to a high temperature;

a switch means connected in series with said heating means and said source of electrical current; and

a removable non-conductive circuit breaker member connected to said carrying strap and the switch means, which circuit breaker member activates the switch means when an excessive removal force is applied to the carrying strap.

4,162,696

SUPPORT FOR A CAMERA

Jürgen Sprung, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,152

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714871

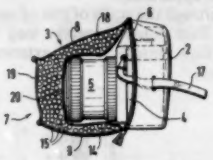
Int. Cl.[2] B65B *11/00*

U.S. Cl. 150—52 J **11 Claims**

1. A combined camera stand and camera case, comprising in combination a cushion-like member forming a wall of the camera case, said cushion-like member having an adequate pliability and thickness for adjusting its shape to the contours of an object,

being operative for retaining its adjusted shape until manually changed for supporting a camera, and alternatively for pliably accommodating the camera in said case, and

including two end walls flexibly interconnected along their peripheries to define a hollow interspace therebetween,



the volume of said interspace being arbitrarily changeable, and

pliable means for filling at least part of said hollow interspace, said pliable means being changeable in shape and dimensions.

4,162,697

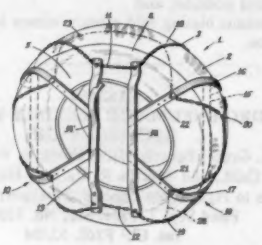
REMOVABLE ANTISKID DEVICE ON A VEHICLE WHEEL, IN PARTICULAR, AN AUTOMOBILE WHEEL

Peter Zinner, CH-3901 Termen, Switzerland

Filed Aug. 3, 1977, Ser. No. 821,524

Int. Cl.[2] B60C *27/00, 27/02*

U.S. Cl. 152—217 **8 Claims**



1. A removable antiskid device for use on an automobile wheel or the like and including:

two parts gripping two oppositely lying wheel segments respectively, each of said parts comprising

an outer first straight strip lying against the outside of the wheel and having two ends,

an inner second straight strip lying against the inside of the wheel and having two ends, and

flexible members connecting the ends of the inner strip with the ends of the outer strip and flexible members connecting the strips intermediate their ends, at least some of said members having antiskid characteristics, the flexibility of the members permitting them to conform to tires of various configurations, said members extending across the tire in the segment thereof defined by the ends of the first strip; and

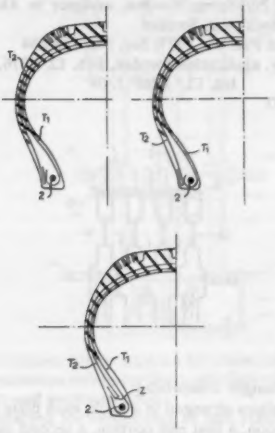
connecting means on the outside of the wheel and connecting said outer strips of said two parts at two locations on said outer strips, which locations are adjacent the ends of the outer strips, and holding each part against the respective wheel segments, said connecting means being releasable to permit said parts to be moved off the respective wheel segments.

4,162,698

RADIAL PNEUMATIC TIRES PROVIDED WITH A STRUCTURE FOR STIFFENING THE WALLS

Claudio Merli, Cormano, and Carlo Francia, Monza, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Sep. 22, 1977, Ser. No. 835,757
Claims priority, application Italy, Oct. 5, 1976, 27993A/76
Int. Cl.[2] B60C 9/08, 15/00
U.S. Cl. 152—354 RB 6 Claims



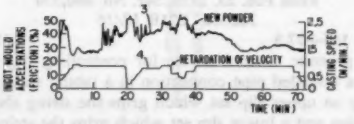
1. A pneumatic tire having an annular tread portion, a pair of axially spaced bead portions disposed radially inwardly relative to said tread portion, each bead portion including a substantially circular bead core, a pair of axially spaced side wall portions extending from said bead portions to said tread portion and a carcass ply structure having radially disposed reinforcing threads extending from one bead portion to the other bead portion, said carcass ply structure being comprised of at least two plies, one of said plies being turned back and anchored to each bead core along each edge thereof and the other of said plies being folded back upon itself adjacent each edge to form a rib disposed adjacent to but not anchored to the respective bead core and having the free edge thereof disposed between said rib and the line joining the points of maximum width of the side walls when the tire is inflated.

4,162,699

CONTROLLING CONTINUOUS CASTING

Bernard G. Mairy, Sclayn-Andenne, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 5, 1977, Ser. No. 839,413
Claims priority, application Belgium, Oct. 5, 1976, 846970; Apr. 15, 1977, 853687; Jun. 20, 1977, 646061
Int. Cl.[2] B22D 11/16
U.S. Cl. 164—4 8 Claims



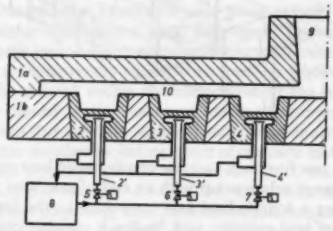
1. A method of controlling a continuous casting process in which the upper surface of molten metal within an oscillating mold is covered by a protective powder, the method comprising: covering said upper surface of molten metal with a powder of given composition; observing the external appearance of the metal issuing from the mold and recording the actual displacements or accelerations of the mold; and modifying the composition of the powder until the quality of the ingot skin can be considered as an optimum, to which corresponds the optimum lubrication of the mold and an ideal acceleration spectrum; subsequently recording the acceleration spectrum of the mold; comparing the recorded spectrum with the ideal spectrum; and modifying a parameter having an effect on the ingot quality at the time at which it is formed in the mold, so as to take up any difference observed between the two spectra.

4,162,700

MECHANISMS FOR CONTROLLING TEMPERATURE AND HEAT BALANCE OF MOLDS

Friedhelm Kahn, 2, Muhlbachstrasse, D 6332 Ehringshausen, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,109
Int. Cl.[2] B22D 27/04, 15/00
U.S. Cl. 164—154 5 Claims



1. Apparatus for casting and controlling the mold heat input and output comprising:

(a) an upper mold half with a riser therein;

(b) a lower mold half with a plurality of combined heating and cooling devices located therein, each of said devices laterally spaced sequentially from a lesser to a greater distance away from said riser;

(c) each of said devices communicating with means for independently supplying heating and cooling mediums thereto; and

(d) control means for initially simultaneously supplying said heating medium to each said device and then selectively supplying said cooling medium thereto beginning with said device at said greater distance and proceeding sequentially to said lesser distance for directional solidification in said mold halves beginning at said greater distance and proceeding to said lesser distance.

4,162,701

THERMAL CONTROL CANISTER

Stanford Ollendorf, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1977, Ser. No. 853,677
Int. Cl.[2] G05D 23/00
U.S. Cl. 165—32 9 Claims

1. Apparatus for maintaining a heat dissipating load at a substantially constant temperature, comprising:

a canister having a plurality of walls in close thermal heat transfer relationship for holding said load therein in heat exchange relationship with at least one of said walls;

a plurality of transfer heat pipes at each end of said canister and in heat exchange relationship with the exterior of each of said walls, said transfer heat pipes having longitudinal axes extending transverse to the longitudinal axis of said canister and having ends thereof in heat exchange rela-

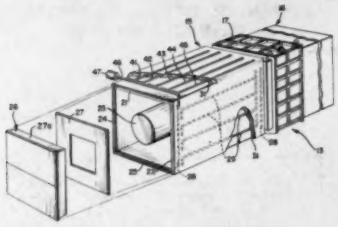
tionship with adjacent ends of said transfer heat pipes on adjacent walls;

a plurality of isothermalizer heat pipes extending between said transfer heat pipes at each end of said canister and in heat exchange relationship with the exterior of said walls and said transfer heat pipes, said isothermalizer heat pipes having longitudinal axes extending parallel to the longitudinal axis of said canister;

a thermal insulator surrounding the exterior of said walls, said transfer heat pipes and said isothermalizer heat pipes;

a thermal radiator covering at least one portion of the exterior surface of said thermal insulator;

a plurality of heat pipes embedded within said thermal radiator having longitudinal axes extending parallel to the longitudinal axis of said canister; and



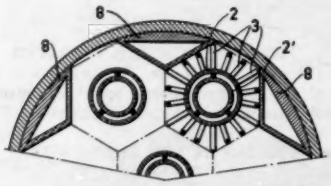
at least one feedback variable conductance heat pipe in heat exchange relationship with an end of said heat pipes and having a longitudinal axis transverse to the longitudinal axis of said canister, said feedback variable conductance heat pipe having one end extending inwardly through said thermal insulator and in heat exchange relationship with at least one of said transfer heat pipes at one of said ends of said canister, said variable conductance heat pipe including a reservoir having a noncondensible fluid therein that expands and contracts as a function of temperature for controlling the number of said heat pipes in heat exchange relationship with said feedback variable conductance heat pipe.

4,162,702

DEVICE FOR DIVIDING THE FLOW IN A HEAT EXCHANGER

Sven E. A. Andersson, Sodertalje, Sweden, assignor to AB Svenska Maskinverken, Jarfalla, Sweden

Filed Mar. 29, 1977, Ser. No. 782,555
Int. Cl.[2] F28D *7/12*
U.S. Cl. 165—142 **7 Claims**



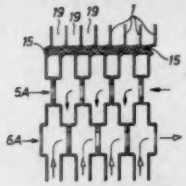
1. A device at a heat exchanger for two media, comprising parallel tubes with surface-enlarging pins and flown through by one of the media and flown about by the second medium in a direction substantially in parallel with the first medium, which tubes are positioned in a casing with a chamber at each end and are so arranged, that the longitudinal passageways with projecting pins between the tubes connect the two chambers, and filler bodies are provided in the spaces between the tubes and the casing having no projecting pins, characterized in that at least some of the filler bodies are hollow at their ends and open each into one of said chambers, that the connecting opening for each inlet or outlet for the medium flowing between the tubes is positioned through the casing in a point between the two chambers and so, that in this point the entire cross-section provided with pins communicates with the connecting opening.

4,162,703

PLATE-TYPE HEAT EXCHANGER

Jan A. Bosaeus, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Feb. 11, 1977, Ser. No. 769,234
Claims priority, application Sweden, Feb. 12, 1976, 7601607
Int. Cl.[2] F28F *3/08*
U.S. Cl. 165—167 **11 Claims**



1. A heat exchanger comprising:

a plurality of plates arranged in a stack, each plate having, in a first direction, a first end portion, a second end portion and an intervening heat exchange surface, the first end portion having both an inlet passageway for a first fluid and an outlet passageway for a second fluid, and the second end portion having both an inlet passageway for the second fluid and an outlet passageway for the first fluid,

means being provided in order to for separating the plates from one another to define spaces, the spaces being located adjacent one another with each space being between adjacent plates,

the space on one side of each plate carrying the first fluid and the space on the other side of each plate carrying the second fluid,

the inlet and the outlet of each end portion each being arranged in the form of a plurality of openings located in at least one row extending in a second direction transversely of the first direction of the plates, and

elements for separating the inlet from the outlet in each end portion of each plate, the elements being provided in the spaces between the adjacent plates, with all the openings of the inlet at one end portion of each plate, and all the openings of the outlet at the other end portion of the adjacent plate, communicating with the space between the adjacent plates.

4,162,704

PRESSURE CONTROL DEVICE

Albert W. Gunther, P.O. Box 615, Harvey, La. 70059

Filed Feb. 23, 1978, Ser. No. 880,370
Int. Cl.[2] E21B *19/16*
U.S. Cl. 166—77.5 **21 Claims**

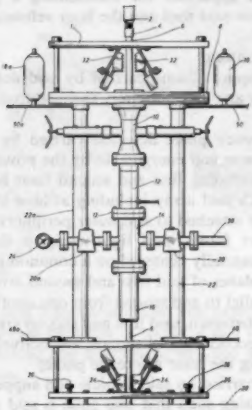
1. A pressure control device for controlling the pressure around a threaded pipe connection in a tubing string held in place by an upper slip set which grips the string above said connection and a lower slip set which grips the string below said connection, said control device comprising:

a rotatable upper platform adapted for use with said upper slip set to enable rotation of a first joint of pipe above said connection and, to prevent upward movement of said first joint relative to said platform;

a stationary lower base adapted for use with said lower slip

set to prevent rotation of a second joint of pipe below said connection and, to support the weight of said string;

means adapted for connection to said platform for forming a pressure containing enclosure around said threaded pipe connection, said connection joining said first joint to said second joint, said enclosure having a longitudinal opening;



pressure release means adapted for connection to said pressure enclosure means for the controlled release of pressure within said enclosure; and

means adapted for connecting to said platform and to said base for longitudinally positioning said enclosure from a first position in which said connection protrudes above said platform to a second position in which said connection is contained within said enclosure.

4,162,705

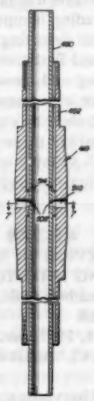
CENTER SECTION FOR OIL WELL PERFORATION TESTING DEVICE

Milton L. Daigle, 359 S. Van Ave., Houma, La. 70306

Continuation-in-part of Ser. No. 802,481, Jun. 1, 1977, Pat. No. 4,103,741. This application Apr. 28, 1978, Ser. No. 901,307

Int. Cl.[2] E21B *33/122*

U.S. Cl. 166—186 **4 Claims**



1. In combination with a pair of axially spaced tubular well tool subsections including adjacent end portions and to be serially connected in an elongated well tool to include a central longitudinal passage therethrough, an outlet from said passage to the exterior of said tool between longitudinally spaced packer zones thereof spaced between said sections and a fluid bypass through said tool, independent of said longitudinal passage, communicated at its opposite ends with the exterior of said tool on remote sides of said packer zones, a tool assembly for connection between said sections, said assembly including an inner tubular member and an outer tubular section telescoped over said inner tubular member, said inner member and outer section including pairs of corresponding loosely telescoped end portions defining annular passages therebetween, first means sealingly coupling the end portions of said inner tubular members within the adjacent end portions of said subsections, second means sealingly coupling the remote ends of said outer tubular member to said adjacent ends, one pair of section end portions including ports opening therethrough from the corresponding annular passages to the exterior of said tool assembly, said outer tubular section including axially spaced mounting portions disposed intermediate said ports for supporting packer assemblies therefrom, said assembly including port means communicating the interior of said inner tubular member with the exterior of said assembly intermediate said mounting portions independent of said annular passages and defining passage means communicating said annular passages independent of said port means and the interior of said inner tubular member, the interior of said inner tubular member being straight, unobstructed and "fully open" throughout the length of said inner tubular member, the inner tubular member including a diametrically enlarged midportion whose exterior is sealingly secured within the midportion of the interior of said outer tubular section, said port means comprising aligned ports formed through said sealingly secured midportions, said inner tubular member including a pair of opposite end member sections and a center member section into which the adjacent ends of said end member sections are removably threadedly engaged and comprising said diametrically enlarged midportion, a sleeve secured within the midportion of said outer tubular section, said outer tubular section midportion, said sleeve and diametrically enlarged midportion having aligned ports formed therethrough, said diametrically enlarged midportion being loosely telescoped in said sleeve defining an annular passage therebetween, and weld material formed completely about the adjacent ends of said sleeve and enlarged midportion ports bridging said annular passage, said aligned ports and weld material defining said port means.

4,162,706

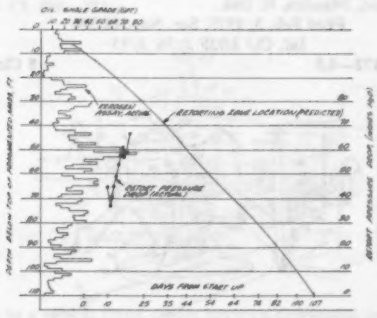
DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN OIL SHALE RETORT BY MONITORING PRESSURE DROP ACROSS THE RETORT

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 12, 1978, Ser. No. 868,924

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—251 **31 Claims**



3. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of particles containing oil shale in an in situ oil shale retort in a subterra-

nean formation containing oil shale, the retort having an inlet gas introduced thereto and an effluent gas passing therefrom, the method comprising the steps of:

determining kerogen content in formation containing oil shale at selected locations in the retort before processing the selected locations;

determining, at least twice, the pressure difference between the inlet gas to the retort and the effluent gas from the retort during processing; and

determining the first derivative of such determined pressure difference versus time.

4,162,707

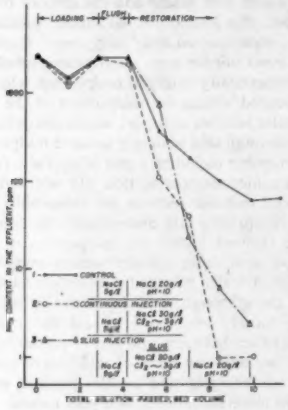
METHOD OF TREATING FORMATION TO REMOVE AMMONIUM IONS

Tsoung-yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,760

Int. Cl.[2] E21B *43/22, 43/27, 43/28*

U.S. Cl. 166—252 **18 Claims**



1. A method of treating a subterranean clay-containing formation having ammonium ions absorbed on the clay, the method comprising:

flushing said formation with a halogenated restoration fluid having a halogen therein which reacts with ammonia in the formation to decompose said ammonia.

4,162,708

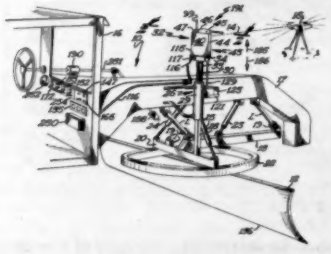
TOOL CARRYING VEHICLE WITH LASER CONTROL APPARATUS

Phillip R. Johnson, Mandan, N. Dak., assignor to Dakota Electron, Inc., Mandan, N. Dak.

Filed Feb. 3, 1975, Ser. No. 546,544

Int. Cl.[2] E02F *3/76, 3/85*

U.S. Cl. 172—4.5 **8 Claims**



1. In combination with a vehicle having a power supply and movable over a given land surface and having a tool attached to the vehicle and movable toward and away from a laser reference plane generated by a swinging laser beam, and further including a power device carried by the vehicle, energizable by the power supply, and operatively connected with said tool to move said tool toward and away from the laser reference plane, an apparatus for maintaining a predetermined distance between said tool and the laser reference plane comprising:

a detector housing;

a detector support frame carried by said detector housing and having an outer periphery facing outwardly from said housing;

a laser reference plane detector carried by said detector support frame and energizable by the power supply, said detector including first and second laser beam detecting arrays, each said array including at least one light-sensitive device attached to said outer periphery of said detector support frame, said light-sensigive device of each array substantially centered on a common plane, with the common planes of said first and second arrays being generally parallel to and spaced from one another to define a zone therebetween, said first and second arrays producing first and second control signals, respectively, in response to detecting the laser reference plane;

a mounting carried by said vehicle and supporting said detector housing such that said zone is said predetermined distance from said tool, said mounting being movable relative to said vehicle to move said detector housing in response to movement of said tool relative to said vehicle to thereby maintain said predetermined distance between said tool and said zone of said detector when said tool is moved relative to said vehicle;

electrical control circuitry energizable by the power supply and operatively connected to said first and second detecting arrays to receive said first and second control signals from said arrays, said control circuitry connected to said power device and responsive to said first and second control signals to actuate said power device to move said tool relative to said vehicle, causing said detector housing to be moved relative to said vehicle by said mounting so said detector in said detector housing closely follows the laser reference plane to retain the reference plane between said arrays, thus assuring said tool in said predetermined distance from the laser reference plane; and

said detector support frame including means for controlling the coarseness of grading comprising a first carriage with one of said laser beam detecting arrays being mounted on said first carriage, said first carriage being wholly within said detector housing and movably mounted relative to said second array for movement toward and away from said second array to thereby vary the distance of separation between said arrays to permit said zone to be of a predetermined width suitable to the degree of coarseness permissible in working the given land surface.

4,162,709

SOD HARVESTING SEVERING MEANS FOR FORMING AND ORIENTING INDIVIDUAL SOD PADS

Woodrow L. Wilson, Columbus, Ohio, assignor to Wilson-Miner R & D, Groveport, Ohio

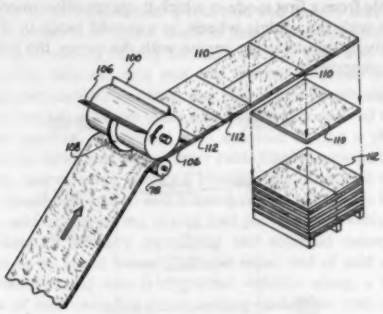
Filed Jul. 21, 1977, Ser. No. 817,547

Int. Cl.[2] A01B *45/04*

U.S. Cl. 172—20 **11 Claims**

6. In an apparatus for harvesting sod, the combination of a portable frame means adapted for movement over a field of sod; cutting means mounted on said frame means and adapted to separate a strip of sod from the ground; conveying means mounted on said frame means adjacent to said cutting means for carrying said strip of sod rearwardly; severing means mounted on said frame means adjacent to said conveying means for severing said continuous strip of sod in a manner to

form sod pads of relatively uniform length and width, said severing means including a rotary knife means including a plurality of blades extending transversely to the direction of travel of said strip of sod and at least one blade disposed between two of said transverse blades and extending longitudinally relative to the direction of travel of said strip of sod; and means for receiving and discharging said sod pads severed by said knife means.

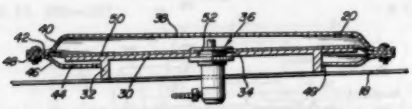


4,162,710

LOG TRUCK SCALE PAD AND POP-OFF VALVE

Fred E. Sjogren, Coos Bay, Oreg., assignor to Kenneth A. Sjogren, Coquile; Alan L. Sjogren and Glenda J. Sjogren, both of Coos Bay, all of, Oreg., part interest to each

Filed Nov. 14, 1977, Ser. No. 854,311
Int. Cl.[2] G01G *19/10, 5/04*
U.S. Cl. 177—141 **7 Claims**



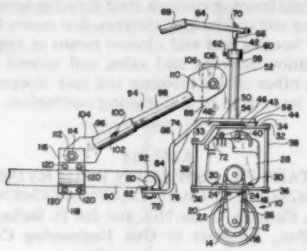
1. A scale pad for a log bunk, said pad including a horizontal table including a central portion and a support portion for rigid support from an underlying vehicle mounting portion, an upper top plate including a downwardly directed peripheral flange and centered over said table, a diaphragm sealingly secured to and extending between remote portions of said peripheral flange below said top plate and overlying and supported from said table and sealingly secured thereto about said central portion, said top plate and table including coacting means guiding said top plate from said table for vertical movement relative thereto, limited horizontal shifting relative thereto and limited canting relative thereto in all directions about a central zone of said table, and a vertically elongated pop-off valve assembly sealingly secured through said central portion of said table, including a central upstanding and upwardly projectable tubular piston plunger engageable with the underside of said top plate and projectable upwardly in response to said valve assembly being charged at its lower end below said plunger, said assembly including vent means operative to vent said assembly, below said piston plunger, to the ambient atmosphere in response to upward movement of said plunger beyond a predetermined level and to close said assembly against venting to the ambient atmosphere upon lowering of said plunger below said predetermined level.

4,162,711

TRAILER DRIVE APPARATUS

Gordon Cornelius, 15231 Jaspar St., N.W., Anoka, Minn. 55303

Filed Sep. 14, 1977, Ser. No. 833,091
Int. Cl.[2] B62D *51/04*
U.S. Cl. 180—13 **2 Claims**



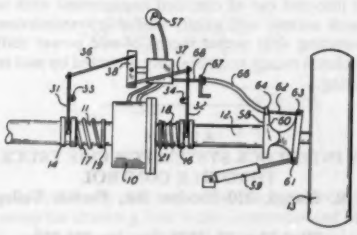
1. A trailer drive apparatus for connection to a trailer hitch and bar comprising a wheel, a gasoline operated engine, an engine mounting plate, said gasoline operated engine having an output shaft, said output shaft rotationally coupled to said wheel, said wheel journaled to said engine mounting plate, a support plate, means to journal said engine mounting plate to said support plate about a vertical axis, means to removably couple said support plate to the trailer hitch on the hitch bar, a truss, one end of said truss pivotably and lockingly engaged to the trailer hitch bar, means to adjustably and lockingly vary the length of said truss, a rod, a plate, one end of said rod fixedly secured to said plate, said plate fixedly secured to said engine mounting plate in spaced apart relationship, said gasoline operated engine disposed intermediate said engine mounting plate and said plate, a tube, one end of said tube fixedly secured to said support plate, a portion of said rod being journaled within said tube, the other end of said truss pivotably and lockingly secured to said tube, a handlebar, said handlebar fixedly secured to the other end of said rod, wherein said support plate extends outwardly from the exterior portion of said gasoline operated engine and downwardly therefrom whereby said gasoline operated engine may be rotated 360° and whereby rotating said handlebar manually causes said motor mounting plate to rotate said 360°.

4,162,712

VEHICLE DIFFERENTIAL CONTROL

Carl D. Nelson, Glendale, Ariz., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 27, 1978, Ser. No. 890,326
Int. Cl.[2] B60K *17/30*
U.S. Cl. 180—253 **4 Claims**



1. In a vehicle drive system having a differential including a fluid actuated lock-up element, two wheel axles drivingly connected with said differential and extending from opposite sides thereof, a ground wheel steerably connected with the extending end of each of said axles, steering mechanism con-

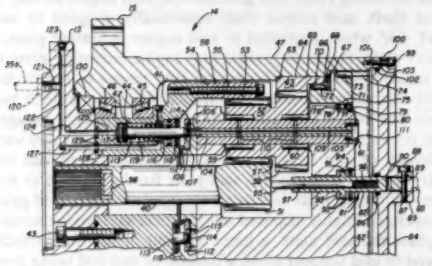
nected with each of said wheels, and a fluid power source, the improvement comprising means for controlling said lock-up element in response to both the relative rotational speeds of said axles and the steering position of said steering mechanism, said controlling means including: a valve housing movably mounted on said vehicle, a closure means movably mounted in said housing whereby relative movement between said closure means and said housing controls fluid flow between said fluid power source and said lock-up element; first means for moving one of said housing and said closure means in response to a relative rotation between said axles; and second means for moving the other of said housing and said closure means in response to movement of said steering mechanism.

4,162,713

PLANETARY TRANSMISSION WITH HYDRAULIC ENGAGEMENT AND DISENGAGEMENT

Marshall D. Heitman, Cedar Hill, and Joe D. Butler, Houston, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 3, 1978, Ser. No. 892,885
Int. Cl.[2] B60K *7/00*
U.S. Cl. 180—242 **41 Claims**



1. In a planetary transmission shiftable between drive engaged and drive disengaged states: power shift means with transmission shift output means; a transmission housing rotatably mounted on said power shift means; drive power input means adapted for drive power input from a first end of said transmission; a removable cover on a second end of said transmission; sun gear means drive connected to said drive power input means; a planetary carrier; planetary gear means rotatably mounted in said planetary carrier, and with said planetary carrier rotatably mounted within said transmission housing; first ring gear means non-rotatably mounted on said power shift means; second ring gear means rotatably mounted within said transmission housing; said planetary gear means driven by said sun gear means and in meshed engagement with both said first and second ring gears; ring gear clutch means; clutch means non-rotatably mounted by said transmission housing shiftable into and out of clutched engagement with said ring gear clutch means; and axially shiftable transmission means interconnecting shift output means of said power shift means and said clutch means non-rotatably mounted by said transmission housing.

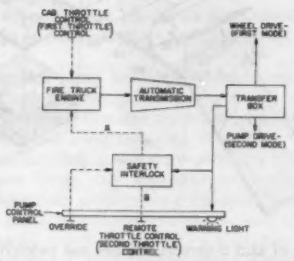
4,162,714

SAFETY INTERLOCK SYSTEM FOR FIRE TRUCK PUMP THROTTLE CONTROL

Richard R. Correll, 320 Escobar Rd., Portola Valley, Calif. 94025

Filed Mar. 15, 1978, Ser. No. 886,860
Int. Cl.[2] B60K *25/06*
U.S. Cl. 180—53 R **17 Claims**

1. In a vehicle of the type in which the engine can either propel the vehicle or drive a pump carried by the vehicle for dispensing fluids, the vehicle having a first throttle control which is manually operable from its cab for varying the engine speed when the vehicle is being driven, and a second throttle control remote from the cab for varying the engine speed when the engine is driving the pump, the vehicle further having a transfer box which is coupled through an automatic transmission to the engine, the transfer box being manually shiftable from a first mode in which it operatively connects the engine with the vehicle wheels, to a second mode in which it operatively connects the engine with the pump, the improvement comprising:



means for detecting the mode of the transfer box; and

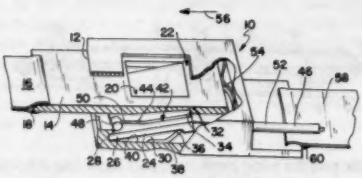
means responsive to the detection means for locking the second throttle control in its closed position when the transfer box is in its first mode to prevent the engine speed from being advanced from a position remote from the cab while the engine is engaged with the drive wheels of the vehicle.

4,162,715

AUTOMATIC RELEASING SEAT BELT

George Coulombe, 289 Tenby St., Coquitlam, Canada

Filed Oct. 26, 1977, Ser. No. 845,485
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—801 **4 Claims**



1. An automatic releasing seat belt comprising a pair of belts, one end of one of said pair of belts secured to a tongue-like plate, one end of the other of said pair of belts secured to a housing, means to manually releasably secure said tongue-like plate to said housing, said means to manually releasably secure includes said housing having a cavity, said housing having a slot, said slot communicating with the exterior of said housing and said cavity, said housing having an opening, said opening being disposed adjacent said slot, a camming plate, said camming plate being disposed within said cavity, one end of said camming plate being pivotably engaged within said cavity, said tongue-like plate having an opening, said opening in said tongue-like plate being disposed adjacent said opening in said housing when said tongue-like plate is disposed passing through said slot, the other end of said camming plate being disposed in touching engagement with a portion of the marginal edges of said opening in said tongue-like plate, a spring, said spring urging said other end of said camming plate in said touching engagement, whereby the application of manually applied force to said camming plate causes said other end thereof to be disengaged from said portion of said marginal edges of said opening of said tongue-like plate releasing said

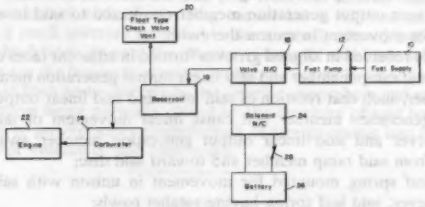
tongue-like plate from said housing, means to release said tongue-like plate from engagement with said housing upon the occurrence of an impact on a sensor, said means to release said tongue-like plate includes a flexible cable, said flexible cable having an inner cable and a sheath, said inner cable slidably engaged within said sheath, a rod, said rod fixedly secured to one end of said inner cable, said rod being disposed within said cavity, said housing having another opening, a portion of said inner cable adjacent said one end thereof disposed passing through said another opening, one end of said sheath adjacent said one end of said inner cable disposed fixedly secured to said another opening, a solenoid, said solenoid having a plunger therein, the other end of said inner cable fixedly secured to said plunger, said solenoid having a housing, the other end of said sheath fixedly secured to said housing of said solenoid, a helical spring, said helical spring urging said plunger outwardly from said solenoid, whereby energizing said solenoid causes said plunger to be urged away from said other end of said sheath and whereby said rod is displaced slidably along a lateral surface of said camming plate causing said other end of said camming plate to be disengaged from said portion of said marginal edges of said opening in said tongue-like plate, means to variably adjust the sensitivity of said sensor responsive to said impact, a timer, means to operate said timer upon said impact, whereby said timer delays said release from engagement of said tongue-like plate to said housing a period of time after the occurrence of said impact.

4,162,716

FORCED ENGINE DISABLEMENT SYSTEM

Howard D. Lisnow, 2765 Carson St., Torrance, Calif. 90503

Filed Feb. 21, 1978, Ser. No. 879,095
Int. Cl.[2] B60R *25/04*
U.S. Cl. 180—287 **8 Claims**



1. A theft protection device for limiting fuel in a vehicle having a fuel pump, a carburetor and an engine comprising:

a reservoir located above the carburetor connected in series with the fuel line between the fuel pump and the carburetor and adapted to hold a limited supply of fuel,

a float type check valve vent located in the uppermost part of said reservoir for sealing said vent in the presence of fuel from the fuel pump filling said reservoir, and

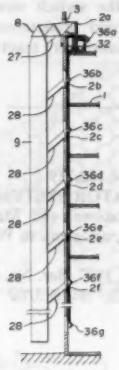
a single normally opened controllable valve connected in series with the line between the fuel pump and said reservoir for pressurizing said reservoir with fuel from the fuel pump and feeding said pressurized fuel from said reservoir to said carburetor whereby closing said normally opened controllable valve gravity feeds the engine with said limited fuel from said reservoir by opening said float type check valve vent until the fuel is exhausted and the engine stalls.

4,162,717

ESCAPE DEVICE

Katsuo Orii, and Haruo Fushima, both of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,499
Claims priority, application Japan, Nov. 29, 1976, 51-143102; Nov. 29, 1976, 51-143107; Dec. 15, 1976, 51-151387
Int. Cl.[2] A62B *1/20*
U.S. Cl. 182—48 **5 Claims**



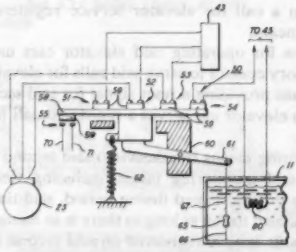
1. A fire escape comprising an escape means; a hardware which is expandable or foldable and hangs said escape means therefrom; a storage container for storing said escape means and said hardware; and a brace frame which has said hardware provided in said storage container so as to be movable vertically from the inside of said storage container; whereby, with raising of said brace frame, a part of said escape means is thrown out and down from said storage container and the falling force of said escape means partly thrown out is used to pull out said remaining escape means and to deploy said hardware.

4,162,718

HYDRAULIC ELEVATOR

Donald F. Lamprey, 114 Glenwood Dr., Liverpool, N.Y. 13088

Filed Aug. 15, 1977, Ser. No. 824,295
Int. Cl.[2] B66B *5/02*
U.S. Cl. 187—29 A **4 Claims**



1. In a hydraulically operated lift of the type having a motor driven pump for drawing fluid from a reservoir and delivering the fluid under pressure to a ram adapted to raise and lower the lift, valve means for directing fluid between the reservoir and the ram, computer means for controlling the operation of the pump motor and the valve means to raise and lower the lift, the improvement comprising

switch means having motor contacts electrically interposed between a starter and the pump motor, said switch means

being movable between a first operative position in which the motor contacts are closed to provide power to said motor and a second operable position in which said motor contacts are opened to inactivate said motor,

biasing means for urging the switch means toward the second operable position, and

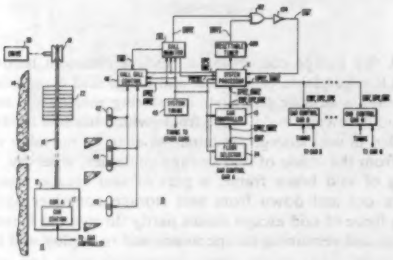
thermal sensitive means in heat transfer relation with the fluid contained in the reservoir for physically holding the switch in said first operative position when the temperature of the fluid is below a predetermined level and to immediately release the switch means when the fluid temperature reaches said predetermined level whereby the pump motor is immediately inactivated.

4,162,719

ELEVATOR SYSTEM

Alan L. Husson, Hackettstown, and Marvin Kurland, East Brunswick, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1977, Ser. No. 856,065
Int. Cl.[2] B66B *5/02*
U.S. Cl. 187—29 R **7 Claims**



1. An elevator system for a building having a plurality of floors, comprising:

a plurality of elevators cars,

first means mounting said plurality of elevator cars for movement in the building to serve the floors therein,

second means for registering calls for elevator service,

car control means for each of said plurality of elevator cars, said car control means enabling each elevator car to respond to a call for elevator service registered on said second means,

third means for operating said elevator cars under group supervisory control to serve said calls for elevator service,

fourth means providing a reset signal for said second means when an elevator car serves a registered call for elevator service,

and monitoring means responsive to said second and fourth means, said monitoring means including timing means having a predetermined timing period, said timing means being enabled to run as long as there is an unanswered call for elevator service registered on said second means, said timer means being reset to the start of its predetermined timing period each time said fourth means resets any registered call for elevator service, said monitoring means providing a predetermined control signal when said timing means is not reset by said fourth means and is allowed to reach the end of its predetermined timing period,

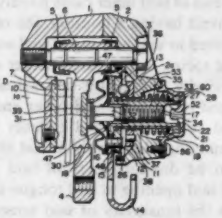
said third means being responsive to said monitoring means, removing said elevator cars from group supervisory control by said third means in response to the predetermined control signal being provided by said monitoring means.

4,162,720

MECHANICAL DISC BRAKE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Nov. 10, 1977, Ser. No. 850,485
Claims priority, application Japan, Nov. 20, 1976, 51-139921
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—71.9 **4 Claims**



1. A mechanical disc brake comprising:

a rotary disc;

a caliper having first and second legs disposed on the opposite sides of said rotary disc;

said second leg having a through-hole extending in the axial direction of said disc;

said first leg having mounted thereon a first friction pad facing a first side of said disc;

a stationary support having mounted thereon a second friction pad facing a second side of said disc;

a bolt extending between said first and second legs and having an intermediate portion slidably received in said support;

a ramp member mounted against rotation on said second leg;

a rotational input receiving lever mounted for rotation;

a linear output generation member connected to said lever for movement in unison therewith;

balls received in aligned grooves formed in adjacent faces of said ramp member and said linear output generation member, such that rotation of said lever and said linear output generation member will cause linear movement of said lever and said linear output generation member away from said ramp member and toward said disc;

a leaf spring mounted for movement in unison with said lever, said leaf spring having ratchet pawls;

a nut including an integral flange having an outer periphery which is positioned between said linear output generation member and said leaf spring, such that said nut is moved linearly upon linear movement of said linear output generation member, said flange having an inner face formed with ratchet teeth for engaging said ratchet pawls;

a push rod extending through said nut in threaded engagement therewith for applying said second friction pad against said second side of said disc upon linear movement of said nut;

a spring having first and second ends, said first end of said spring abutting against said second leg; and

a sleeve rotatably surrounding said nut and having an open first end connected to said linear output generation member and an open second end abutting against said second end of said spring, such that said spring normally biases said linear output generation member towards said second leg.

4,162,721

SLIDING CALIPER TYPE DISC BRAKE

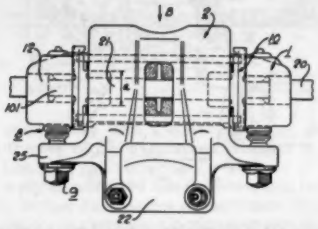
Michio Moriya, Toyonaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,516

Claims priority, application Japan, Jul. 28, 1976, 51-101601[U]; Mar. 3, 1977, 52-23436; Apr. 14, 1977, 52-47608[U]

Int. Cl.[2] F16D 65/02

U.S. Cl. 188—73.3 12 Claims



1. A sliding caliper type disc brake comprising, a brake disc which is capable of rotation, a torque member which is fixed to the frame of the vehicle or another similar part of the vehicle and which has circumferentially spaced torque receiving parts on both sides of the disc respectively, friction pads which are coupled with said torque receiving parts and guided so as to be mutually slidable on said torque receiving parts to permit frictional braking engagement of said pads to opposite sides of said disc, and a caliper member which straddles over the outer circumference of said disc and is operable to move said friction pads into braking engagement with said disc, said caliper slidably guided with respect to said torque member by a pair of pins connected to and extending from one of said members and slidably received in corresponding guide holes penetrating through the other of said members, the improvement comprising a pair of bush boots of an elastic material seated in and lining said guide holes and normally closed at one end thereof for respectively slidably receiving said pins therein and normally closing off the free ends of said pins from the exterior atmosphere, said bush boots having integral dust boots at the other ends thereof which freely expand and contract between said members to close off said pins from the exterior atmosphere at their ends of extending connection to said one member, a small aperture provided in the normally closed end of said bush boots to vent the interior volume of said bush boots between the free ends of said pins and the normally closed end of said bush boots directly to the exterior atmosphere and said apertures being normally closed by the elasticity of said bush boots to prevent entry therethrough of foreign matter into the interior volume of said bush boots.

4,162,722

APPARATUS FOR COLLATING CANS AND OTHER ARTICLES

Leon Early, Mistletoe Farm, Wendling, Norwich, Norfolk, England

Filed Jan. 7, 1977, Ser. No. 757,542

Claims priority, application United Kingdom, Jan. 10, 1976, 906/76

Int. Cl.[2] B65G 47/26

U.S. Cl. 198—418 9 Claims

1. In a collating apparatus for grouping and nesting articles of circular cross-section for subsequent handling, said apparatus having:

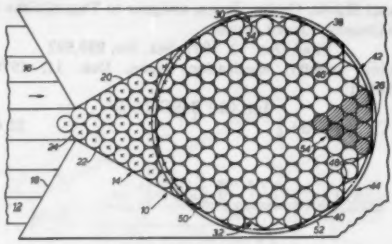
conveyor means for advancing a plurality of said articles in a direction of travel,

converging wall means disposed above said conveyor to engage said articles, said converging wall means being spaced to define a throat therebetween through which the articles must pass, and,

group-forming wall means downstream of said throat to and against which articles are conveyed by said conveyor means;

the improvement comprising:

said group-forming wall means having a central rectilinear wall length wider than said throat against which articles initially passing through said throat engage and abut, said wall length being disposed substantially perpendicular to said conveyor means direction or travel,



said central wall length on each end thereof connecting with pocket-forming wall lengths having irregular article-engaging surfaces and extending generally laterally and upstream of said conveyor means direction of travel, thereby to define an overall generally semi-circular group-forming wall means, and,

diverging wall lengths extending downstream from said throat and connecting respectively with the upstream ends of said pocket-forming wall lengths.

4,162,723

BUFFER STORAGE DEVICE FOR TRANSFERING TEXTILE COILS

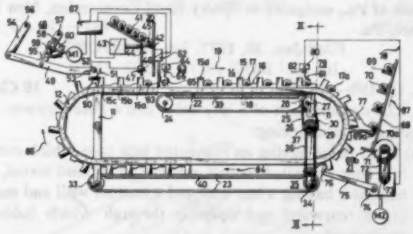
Willi Küpper, Rickelrath, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 718,519, Aug. 30, 1976, abandoned. This application Mar. 14, 1978, Ser. No. 886,410

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538273

Int. Cl.[2] B65G 35/06, 43/08

U.S. Cl. 198—469 7 Claims



1. Buffer storage device for transferring textile coils from an irregularly operating coil feeding device to a uniformly advancing coil delivery device having a given coil delivery velocity comprising a multiplicity of identical transport elements for at least one textile coil, respectively, said transport elements being shiftable towards one another, a conveyer section extending from the coil feeding device to the coil

delivery device, said transport elements being movable on said conveyer section from the coil feeding device to the coil delivery device, and means for varying the velocity of travel of said transport elements along said conveyer section in at least two velocity states so that the travel velocity thereof before reaching the coil delivery device, in travel direction of the transport elements, corresponds to the given coil delivery velocity and otherwise is greater than the coil delivery velocity.

4,162,724

COMPONENT CONVEYING ARRANGEMENT

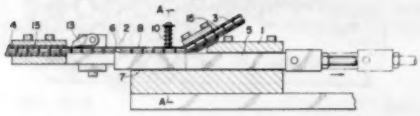
Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seikakusho, Osaka, Japan

Filed Dec. 12, 1977, Ser. No. 859,592

Claims priority, application Japan, Dec. 11, 1976, 51-166294[U]

Int. Cl.[2] B65G *25/10*

U.S. Cl. 198—534 **22 Claims**



1. A conveyor arrangement for conveying small component parts to an automatic assembling machine, the arrangement comprising:

a support means,

guide track means,

guide track means extending along at least a portion of a length of the support means for guiding a movement of the component parts,

means receiprocably arranged at said support means for advancing said component parts from said guide track means, and

means for preventing the component parts from leaving said guide track means including a pair of plate elements arranged on respective sides of said guide track means so as to at least partially overlie the same, means for fixing each of said plate elements to said support means so that a first end of each of said plate elements is fixedly mounted at said support means and a second end of each of said plate elements is freely movable within predetermined limits.

4,162,725

BALE THROWER

Charles A. Smith, New Holland, and Clair S. Adams, Akron, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 30, 1977, Ser. No. 811,792

Int. Cl.[2] B65G *15/14, 31/02, 21/10*

U.S. Cl. 198—628 **10 Claims**

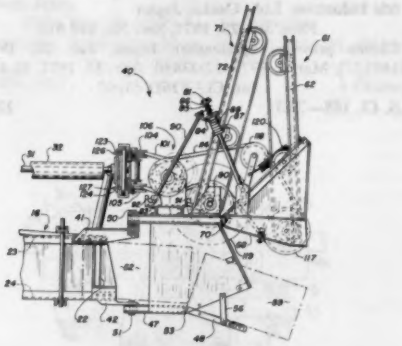
4. The combination of a hay baler and a bale thrower, said combination comprising:

(a) a hay baler having an elongated bale case which extends in a fore-and-aft direction relative to ground travel, said bale case having a top wall and a bottom wall and including a rearward end opening through which bales are discharged;

(b) a first frame means affixed to the discharge end of the bale case;

(c) a second frame means pivotally fixed about a vertical axis to said first frame means;

(d) a bale thrower pivotally affixed to said second frame means for selective movement about at least one horizontal axis between a first position in operative alignment with said rearward end opening of said bale case and a second position wherein said entire bale thrower is substantially out of alignment with said rearward end opening of said bale case; and



(e) drive means operably connected to said bale thrower.

4,162,726

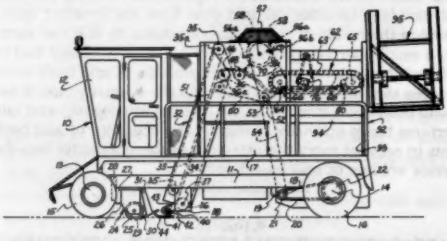
SOD HARVESTING MACHINE HAVING MEANS FOR CONVEYING AND STACKING SOD PADS

William W. Hudson, and Woodrow W. Wilson, both of Columbus, Ohio, assignors to Wilson-Miner R & D, Groveport, Ohio

Filed Jul. 21, 1977, Ser. No. 817,710

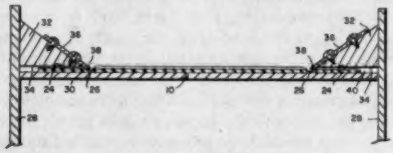
Int. Cl.[2] B65G *15/04, 47/36, 67/08;* A01B *45/04*

U.S. Cl. 198—678 **10 Claims**



10. In a machine for handling sod pads, the combination of: a frame: a conveyer supported on said frame for movement along a conveyer path including a plurality of spaced apart conveyer members each carrying a plurality of teeth disposed at locations to penetrate the sod pads from the top in a manner to successively carry the pads along said conveyer path: means for driving said conveyer along said conveyer path: means for discharging the sod pads from said teeth at a preselected location along said conveyer path, said last mentioned means including a plurality of stripper members for stripping the sod pads off of said teeth; means mounting each stripper member on the frame for movement along a stripping path carrying the respective stripper members between said conveyer members and against a sod pad disposed at said preselected location to strip the pad off of said teeth: and power means for driving each stripper member along its stripping path.

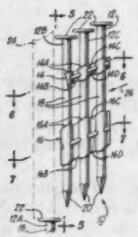
4,162,727
CONVEYOR BELT
Frank B. Summers, Marblehead, Mass., assignor to Fabreeka Products Company, Boston, Mass.
Filed Oct. 26, 1977, Ser. No. 845,634
Int. Cl.[2] B65G 15/42, 21/20
U.S. Cl. 198—688 1 Claim



1. The combination with a conveyor frame and flat bed supported thereby of a conveyor belt arranged to be moved along the bed, said belt comprising a laminate of two fabric plies with a ply of rubberoid therebetween, said belt having a flat bottom surface for freedom of movement along the bed and a top side for implementing motion to material to be transported by the belt, said top side comprising parallel, longitudinally spaced, transversely extending, upwardly-convex ribs interspersed with flat planar surfaces and said ribs occupying a major portion of the width of the belt between its

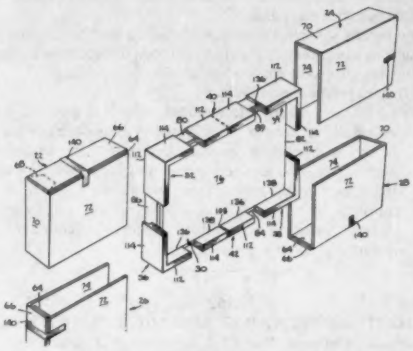
longitudinal edges, rigid skirt boards mounted to the frame along the opposite longitudinal sides of the bed, said rigid skirt boards overlying the opposite side of the belt and having top sides sloping obliquely downwardly toward the top of the bed for confining material transported by the belt, and bottom sides parallel to and spaced from the bed and said belt having along its opposite longitudinal sides planar portions, the surfaces of which lie in the plane of the interspered planar portions, said planar portions at the sides extending laterally from the ends of the ribs beneath the bottom sides of the skirt board, longitudinally-extending grooves in the top side of the belt situated between the planar surfaces at the sides and the ends of the ribs and flexible skirts fastened to the inclined top sides of the skirt boards so as to slope downwardly toward the top of the belt and positioned with their lower edges extending beyond the lower edges of the skirt boards into the longitudinally-extending grooves.

4,162,728
FASTENER ASSEMBLY
Ali I. Uzumcu, Elk Grove Village; Elmer J. Thorsen, Jr., Wood Dale, and Robert M. Demkowicz, Cicero, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.
Filed Dec. 8, 1977, Ser. No. 858,835
Int. Cl.[2] B65D 73/02
U.S. Cl. 206—345 17 Claims



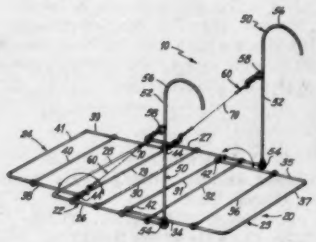
1. In a fastener assembly of the type including a pair of frangible strips holding a plurality of fasteners with their shanks parallel and with their heads and points disposed at opposite sides of the assembly; the improvement in accordance with which the strip adjacent the points of the fasteners is substantially stronger than the strip adjacent the fastener heads, said strips being formed of extruded plastic material, and said stronger strip having an overall average height significantly larger than that of said weaker strip.

4,162,729
PROTECTIVE PACKAGING DEVICE
Louis Kaiser, Orange, and Charles J. Pascal, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.
Filed Oct. 17, 1977, Ser. No. 842,643
Int. Cl.[2] B65D 5/42, 85/30
U.S. Cl. 206—592 17 Claims



1. In combination with an article having a stepped peripheral side portion, a packaging insert comprising, a sheet of flexible foldable material of predetermined thickness having front and rear surfaces, opposite upper and lower edges and first and second side edges, a first, second, third and fourth score-line extending across said first and second side edges at respective predetermined spacings from said upper edge to form four equal first, second, third and fourth foldable portions, and a tail portion extending beyond said fourth scoreline to said lower edge, said insert being folded along said first, second, third and fourth scorelines in accordion fashion, to form a stepped away portion from said tail portion, the predetermined thickness of said insert being selected such that the stepped away portion of said insert substantially corresponds with and engages the stepped peripheral side portion of said article.

4,162,730
PORTABLE ARTICLE HANGER
William H. Steere, Jr., and Marjorie S. Steere, both of 53A Cambridge Ct., Lakewood, N.J. 08701
Filed Apr. 18, 1977, Ser. No. 788,548
Int. Cl.[2] A47F 5/01
U.S. Cl. 211—118 5 Claims



1. A portable article hanger adapted for folding into a compact configuration when not in use, comprising:

(a) an article support unit comprised of (i) a central planar array of article support elements comprising a peripheral frame element and a plurality of spaced, transverse article support elements disposed between opposing sides of said frame element and (ii) at least one terminal planar array comprising a peripheral frame element and a plurality of transverse article support elements disposed between said opposing sides of said frame element, said terminal planar array being in pivotal engagement with the penultimate transverse article support element of one end of the central array and adapted for cantilevered engagement with the ultimate article support element thereof, said penultimate transverse article support element being in adjustable slidable engagement with said frame element of said central planar array; and

(b) a means for pendulously suspending said article support unit in a plurality of erected positions for actively supporting articles, said suspending means comprising:

(i) a suspension element; and

(ii) a linearly adjustable element, which is adapted to be adjusted in length, said linearly adjustable element being in operative engagement with the suspension element and the article support unit for adjustably stabilizing said article support unit in a substantially horizontal plane by changing said article support unit from one erected position to another, whereby the center of gravity of the hanger is altered.

4,162,731

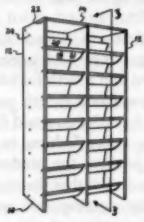
LIGHTWEIGHT, QUICK ASSEMBLY FURNITURE

Theodore C. DeGroot, Box 17-2, Lebanon, N.J. 08833

Filed Jan. 9, 1978, Ser. No. 867,666

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—126 **5 Claims**



1. An article of furniture comprising: a plurality of load bearing members formed from a light weight and low strength material; a plurality of extending members interconnecting said load bearing members for forming a shell therewith when interconnected; a shelf means formed from a light weight flexible material having a first engaging surface formed thereon for engaging said extending members; said engaging surface having a flexible detent member formed thereon for engaging said extending member in a positive locking action; and, said engaging surface is formed in an "e" shape where the open portion of the "e" is smaller than said extending member; said "e" is formed into a latch member which requires releasing to nondestructively remove the extending member from engagement with said "e" shape.

4,162,732

COIL TRANSFER MACHINE

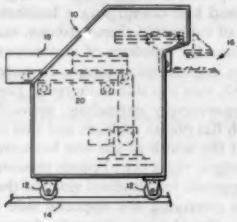
Howard E. Redman, Duxbury, Mass., assignor to Mathewson Corporation, Quincy, Mass.

Filed May 9, 1977, Ser. No. 795,329

Int. Cl.[2] B21F *45/00;* **B66C** *1/42*

U.S. Cl. 414—736 **2 Claims**

1. Apparatus for presenting a row of coils with the coils in the row at a predetermined spacing and properly oriented to coil receiving means at a different predetermined spacing in a spring assembly machine comprising a plurality of spaced magazines for receiving groups of coils, coil gripping means situated at the discharge ends of the magazines for gripping the coils at said ends and transferring them to the receiving means of the spring assembly machine, means supporting the gripping means for arcuate movement about a horizontal axis from a position confronting the magazine to a position confronting the assembly machine and for relative movement along the support to change the spacing between the coils from the spacing corresponding to the spacing of the magazines to a spacing corresponding to the spacing of the coil receiving means of the spring assembly machine, said means supporting the gripping means comprising a rotatably oscillatable beam, blocks corresponding in number to the gripping means having at one side planar surfaces to which the grippers are attached and means at the other side for mounting the blocks to the beam for move-



ment longitudinally thereof and relative to each other, spaced parallel lugs at the upper ends of the blocks, means connecting the lugs of adjacent blocks, said means collectively connecting all of the blocks longitudinally of the beam, said means being adjustable to determine the minimum distance between blocks and further adjustable to limit the maximum distance between blocks, a rigid rod connected to the block at one end of the beam, means for rotating the beam to move the blocks arcuately in planes perpendicular to the axis of the beam approximately 180° from a position in which the grippers confront the coils in the magazines to a position in which they confront the receiving means of the spring assembly machine and means for effecting reciprocation of the rod lengthwise of the beam in timed relation to the oscillation of the beam to effect movement of the grippers along the beam from a spacing corresponding to the spacing of the magazines to a spacing corresponding to the spacing of the receivers.

4,162,733

ARTICLE STACKING APPARATUS

Raymond L. Wiseman, 1550 S. Macon St., Aurora, Colo. 80012

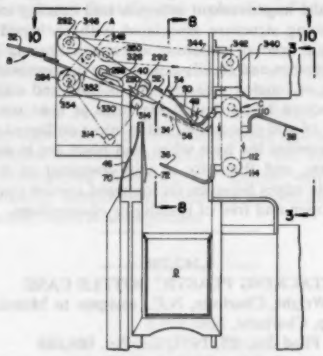
Filed Jun. 21, 1977, Ser. No. 808,715

Int. Cl.[2] B65G *57/06*

U.S. Cl. 414—78 **33 Claims**

1. Stacker apparatus comprising: bottom support means movable downwardly from an upper position for receiving and forming a stack of flat articles moving generally flatways one after another transversely toward said stacker apparatus, said support means in said upper position being first movable generally downwardly with snap acting intercept motion for intercepting the leading edge of a flat article and beginning formation of a new stack of such articles, said support means then being movable downwardly with stack forming motion different from said intercept motion, said support means being

movable substantially more rapidly with said intercept motion than with said stack forming motion, and said intercept motion



and said stack forming motion also being substantially different from one another by motion characteristics other than speed.

4,162,734

ALIGNING AND STACKING ARRANGEMENT

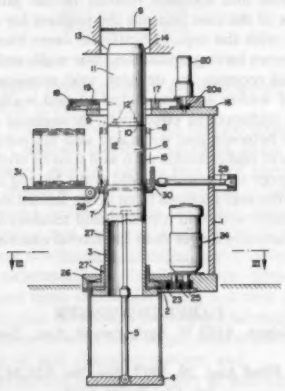
Karl Dangelmaier, Göppingen-Holzheim, and Alfred Bareis, Uhingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,267

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653914

Int. Cl.[2] B65G *57/16*; B65H *31/32*

U.S. Cl. 414—27 **7 Claims**



1. An arrangement for aligning and stacking laminations and for transporting formed stacks of laminations, the laminations being provided with a circular inner and/or outer circumference and having stamped patterns defining a plurality of stampings distributed about the circumference of the laminations at equal centering angles, the arrangement comprising:

a stack forming means for receiving laminations fed individually thereto including at least two stack forming elements mounted so as to be selectively separable, said stack forming elements being disposed one above the other in a longitudinal direction of the stack forming means so as to form an upper stack forming element and a lower stack forming element,

means selectively displaceable into and out of an intermediate stack forming area which surrounds the stack forming means at least in an area of the upper stack forming element for selectively engaging said upper stack forming element so as to maintain said upper stack forming element in a fixed position when said lower stack forming element is displaced to a lowered position and for forming an intermediate stack of laminations including a first ring member rotatably mounted at the intermediate stack forming area, a second ring member fixedly mounted at the intermediate stack forming area, means for selectively rotating said first ring member relative to said second ring member, a plurality of intermediate stack forming members displaceably mounted in said second ring member for a radial displacement, and means arranged at said first and second ring members for causing a displacement of the intermediate stack forming members upon a rotation of said first ring member, and

means for rotating only said lower stack forming element through stepwise predetermined increments when said lower stack forming element is in the lowered position with the predetermined increments being constituted by a whole number multiple of the central angle of the stampings.

4,162,735

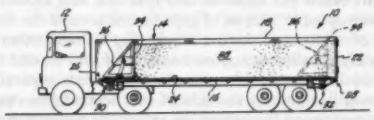
SELF-LOADING/UNLOADING APPARATUS FOR CARGO CARRYING TRUCK OR TRAILER

Milburn Lewis, 18418 94th Ave. NE., Bothell, Wash. 98011

Filed Jul. 26, 1977, Ser. No. 819,122

Int. Cl.[2] B60P *1/00*

U.S. Cl. 414—514 **7 Claims**



1. In a self-unloading apparatus for a cargo-carrying truck or trailer body having sidewalls and a bed therebetween that extends from a forward end to an aft end of the body, wherein said apparatus is the type including a flexible belt covering said bed and means for driving said belt fore and aft, and further including a load pushing bulkhead disposed between said sidewalls and mounted for relative fore and aft movement with respect to said bed, the combination therewith comprising:

a support frame for said bulkhead, said support frame supportively mounting said bulkhead on said body for fore and aft movement relative thereto;

an elongate drive bar affixed to said belt so as to extend crosswise of said bed;

forward and rear drive bar catch means provided on said bulkhead support frame and arranged with respect to said drive bar means such that aft movement of said belt relative to said bulkhead during an unloading operation causes said drive bar means to move into contact with said aft shoulder means and entrain said bulkhead along with said belt as said belt is driven aft during unloading of cargo from the body, and such that forward movement of said belt relative to said bulkhead causes said drive bar means to move into contact with said forward catch means on said bulkhead frame to entrain said bulkhead along with said belt as said belt is driven forward to return said belt and bulkhead to their initial positions adjacent the forward end of said bed, said forward and rear catch means being spaced apart in the fore/aft direction so as to cause a lost motion of said bulkhead relative to said belt at the beginning of each unloading operation, and,

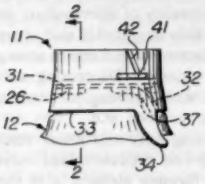
parallel motion means connected between said drive bar means and said bulkhead support frame for maintaining said bulkhead parallel to said drive bar means during the lost motion of said bulkhead relative to said belt.

4,162,736

PLASTIC CAP AND CONTAINER CONSTRUCTION

George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprises, San Carlos, Calif.

Filed Nov. 16, 1977, Ser. No. 852,189
Int. Cl.[2] B65D *41/48*
U.S. Cl. 215—256 5 Claims



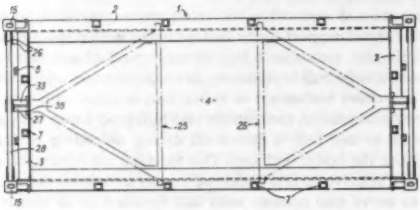
1. A cap having a central top disk, a thin-walled substantially cylindrical outer skirt of substantially uniform thickness depending from the periphery of said disk, said outer skirt being scored and weakened in a circumferential first line spaced downwardly from the top of said outer skirt and in a spiral second line joining said first line and extending down to the bottom edge of said outer skirt, a tab attached to the bottom edge of said outer skirt adjacent said second line, an upper internal circumferential bead on said outer skirt between said first line and said disk, a lower internal second bead on said outer skirt below but adjacent said first line, said second bead being interrupted in a series of gaps spaced around the circumference of said outer skirt, a thickening of said outer skirt immediately paralleling and on one side of said second line, a second thickening of said outer skirt immediately paralleling said second line and on the side of said second line opposite said first-mentioned thickening, an externally projecting finger hold on said outer skirt positioned immediately above the intersection of said first and second lines.

4,162,737

COLLAPSIBLE CONTAINER

Martin Clive-Smith, London, England, assignor to Sea Containers, Ltd., London, England

Division of Ser. No. 803,614, Jun. 6, 1977, abandoned. This application Sep. 1, 1978, Ser. No. 938,789
Claims priority, application United Kingdom, Jun. 4, 1976, 23317/76
Int. Cl.[2] B65D *21/02, 7/28;* B65J *1/02*
U.S. Cl. 220—1.5 7 Claims



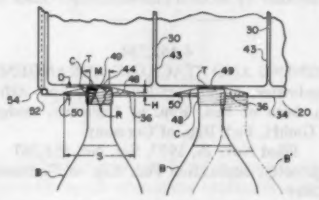
1. In a collapsible container of the open-platform type for conveying goods, said container including a generally elongated rectangular platform base, said base defining a pair of parallel side edges and a pair of parallel end edges extending transversely between said side edges, said side edges being longer than said end edges, a stub post at each corner of the platform base, a corner post pivotally connected to each stub post about an axis substantially parallel to the side edge of the base for permitting pivotal movement of the corner post from a fold-down position, in which the corner post rests either on the base or on the other folded down corner post at that end of the base, into a substantially upright position, and bracing means for holding the corner posts in said upright position, comprising the improvement wherein said bracing means includes a bracing structure associated with each end of said container, said bracing structure when in a bracing position extending between and rigidly connecting the opposed pair of corner posts as located adjacent one of said end edges, said bracing structure being detachable from at least one of the corner posts of said pair and movable into a collapsed position wherein it overlies the base when said posts are in said fold-down position, and the sides of said container as measured along the side edges between the opposed corner posts being completely open and free of bracing or obstructions.

4,162,738

STACKING PLASTIC BOTTLE CASE

William V. Wright, Charlotte, N.C., assignor to Metrolina Design Group, Charlotte, N.C.

Filed Jun. 15, 1977, Ser. No. 806,688
Int. Cl.[2] B65D *1/24, 21/02*
U.S. Cl. 220—21 12 Claims



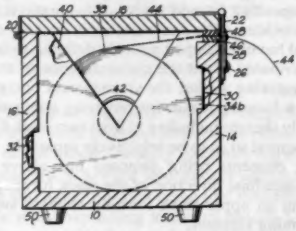
1. A case for bottles having multiple pockets for bottles formed therein and recesses formed in the portions of the undersurface of the case beneath the pockets for case stacking engagement with the tops of bottles in cases located thereunder, said recesses having upstanding side walls and midportions at which said recesses are deepest, said recesses having bottoms located within and connected to said walls and sloping toward said midportions effectively throughout the extent of said recesses between said walls and said midportions for centering action of said bottoms with said tops of bottles wherever said tops engage said bottoms, said walls having a height sufficient to prevent said recesses from being shifted sidewise out of said engagement with said tops and said recesses having lateral extents substantially larger than the lateral extents of said tops.

4,162,739

LABEL DISPENSER

Harlan I. Nelson, 1103 N. Springbrook Ave., Newburg, Oreg. 97132

Filed Aug. 29, 1977, Ser. No. 828,342
Int. Cl.[2] B65H *5/28*
U.S. Cl. 221—70 3 Claims



2. A label dispenser for dispensing adhesive labels from rolls of label tape, comprising:

(a) an enclosure having bottom, side, rear and front walls and a hinged lid,

(b) a plurality of dividers in the enclosure which partition the enclosure laterally into a plurality of laterally spaced pockets,

(c) first and second compressible friction strips attached, respectively, to the enclosure front wall and to the lid, which strips are mutually contacting when the lid is closed, for slidably gripping therebetween the ends of label tape extending outward between said strips,

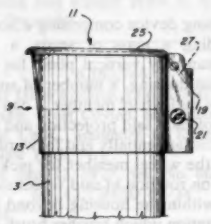
(d) fastener means for fastening the lid shut, and

(e) interengaging means on the bottom wall and lid for releasably interlocking a plurality of said dispensers in a stacked vertical arrangement.

4,162,740
VALVE COVER

Clifford W. Jones, 7068 S. Lafayette Way, Littleton, Colo. 80122

Filed Sep. 29, 1977, Ser. No. 837,518
Int. Cl.[2] B65D *25/00, 25/24, 51/04*
U.S. Cl. 220—85 P **31 Claims**



1. An adjustable valve cover for use with a pipe leading to a valve, said valve cover comprising:

a clamping portion, said clamping portion including a substantially C-shaped member extending along a first axis, said C-shaped member having two back portions extending in a direction substantially parallel to said first axis, said clamping portion further including means for selectively moving said back portions toward each other into an abutting relationship whereby said C-shaped member forms a substantially cylindrical shape with two, open ends spaced from each other along said first axis,

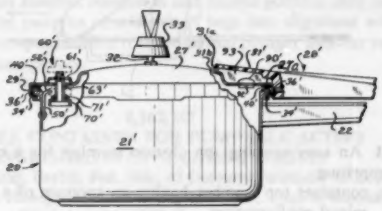
a lid portion, said lid portion including a lid member having a first section with an area larger than a first of said two, open ends of said clamping portion, and,

means for mounting said lid member to said clamping portion for pivotable movement about a second axis between an open position and a closed position, said second axis being substantially perpendicular to said first axis and said first section of said lid member in said closed position substantially covering said first, open end and preventing access to the interior of said clamping portion through said first, open end whereby said clamping portion can be positioned about and releasably secured to an end portion of said pipe at a desired location by said moving means moving said back portions toward said abutting relationship reducing the area substantially enclosed by said C-shaped member and causing frictional engagement between at least a portion of said C-shaped member and said pipe end portion and said lid member moved between said open and closed positions to alternately provide and prevent access to the interior of said clamping portion and said pipe.

4,162,741
PRESSURE COOKER

Duane H. Walker, Fall Creek, and Darrell W. Quarderer, Eau Claire, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Continuation of Ser. No. 792,347, Apr. 29, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,439
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 **27 Claims**



14. In a pressure cooker embodying a vessel having an open top, a removable cover sealable to the vessel over said open top and a pressure relief valve which regulates pressure development therein during cooking, the combination therewith of an overpressure release plug releaseably sealed within an opening in a marginal portion of the cover so as to normally close the opening and be ejectable from the opening to vent the interior of the cooker through the opening to atmosphere when excess pressure developes within the vessel, and a handle fixed to the cover including a hand grip portion which projects radially from the cover and an overhang portion which overlies said marginal portion of the cover containing the overpressure release plug, said marginal portion of the cover and overhang portion of the handle being so shaped as to provide a cavity therebetween in which the overpressure release plug is captivated when it is ejected from the opening in the cover, said overhang portion of the handle having an opening in its side directed away from the handle grip portion which is of a size insufficient to permit escape of the plug from said cavity and directs the escaping fluids toward the center of the cover and away from the hand grip portion of the handle.

20. A pressure cooker comprising, in combination:

a body, having an open top with a peripheral sealing surface, a normally vertical central axis, and a handle extending outward radially;

a cover, for closing the open top of said body, having a rim with a peripheral sealing surface, a plurality of venting passages, and a handle extending outward radially, said cover and said body being mutually rotatable about said axis between a first relagive position, in which said handles are in alignment, and a second relative position, in which said handles are out of alignment by a predetermined angle at said axis;

engagement means for enforcing engagement between said sealing surfaces in said first relative position of said cover and said body, to provide a seal for said cooker;

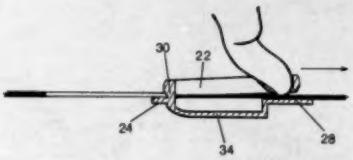
engagement preventing means carried in part by said body and in part by said cover for preventing initial engagement between said sealing surfaces except in said second relative position at only said predetermined angle;

and further independent safety lack means carried in part by said cover and in part by said body for preventing relative movement from said first position to said second position during a superpressure condition when the pressure sealed in said cooker exceeds that ambient to said cooker by more than a predetermined amount, and for venting said cooker except during said superpressure condition in said first relative position.

4,162,742
EASY OPENING TOP CLOSURE MEMBER FOR A CONTAINER

Kuno J. Vogt, 4250½ Fairmont Ave., San Diego, Calif. 92105

Filed Jul. 24, 1978, Ser. No. 927,368
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 7 Claims



1. An easy opening top closure member for a containing comprising:

a container top member having an aperture of a predetermined configuration,

a closure member for said aperture having an exterior portion and an interior portion,

said exterior portion being in the form of a retaining ridge that extends upwardly from said interior portion, said retaining ridge functioning to provide a surface against which the tip of a finger can be pushed to uncover and also cover said aperture,

said interior portion being in the form of a disc whose lateral dimensions are greater than that of said aperture whereby the outer periphery of said disc functions as a pressure sealing lip against the underside of said top member, and

the lower portion of said retaining ridge being frangibly connected to said disc along a predetermined portion of said retaining ridge whereby either a downward force against a predetermined area of said disc or an upward pulling force against a predetermined portion of said retaining ridge will cause said retaining ridge to separate from said disc along said predetermined frangible portion thereby allowing said closure member to be slid rearwardly and forwardly to respectively open and close said closure member.

4,162,743
TAB SYSTEM

Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

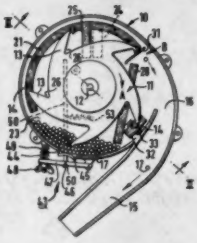
Division of Ser. No. 865,447, Dec. 29, 1977, Pat. No. 4,130,074.
This application Jul. 21, 1978, Ser. No. 926,669
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 5 Claims

1. In a tab comprising a body having an inner surface to be mounted facing a container wall, said container wall having a tear panel therein, an outer surface to be mounted facing away from said container wall, a lifting end to be lifted away from the container wall to sever said tear panel, an attachment portion for fastening said tab to said container wall and for allowing pivotal movement of said tab when said lifting end is lifted and a forward end for impinging with force on said container wall and tab dab is thereby caused to pivot, the improvement comprising an end portion of a severed stitch affixed to an end of said tab, said stitch being located between the ends of an outer peripheral edge of the body which is curled onto the inner surface thereof except at a gap formed at said stitch and wherein said gap is equal in width to the width of said stitch.

4,162,744
SEED DISPENSING DEVICE

Robert J. Barker, 26 Ashley Rd., Newmarket, Suffolk, and Brynley M. Barker, 18 Saxon Rise, Bury St. Edmunds, Suffolk, both of England

Filed Oct. 27, 1977, Ser. No. 846,011
Claims priority, application United Kingdom, Oct. 28, 1976, 44763/76
Int. Cl.[2] A01C *7/04*
U.S. Cl. 221—251 15 Claims



1. A seed dispensing device comprising a housing defining a reservoir for holding a mass of seeds, a wheel member mounted in a substantially vertical plane for rotation in one direction within said housing, a number of spoke-like projections radiating from said wheel member, a cup mounted on the radially outer end of each said projection and so oriented that the cup mouth opens tangentially and forwardly in said direction of rotation of the wheel member for picking up one seed from the reservoir on rotation of said wheel member, opposed brushes arranged within the housing beyond the reservoir in said direction of rotation which brushes brush against the cups to aid retention of seeds therein as each cup is rotated past the top dead center position, outlet means from said housing situated outside the periphery of wheel member beyond said brushes in the direction of rotation for receiving seeds discharged from said cups under the combined action of centrifugal and gravitational forces and dispensing the same, ejecting means to eject foreign matter from the mass of seeds contained in the reservoir, the ejecting means comprising an aperture formed in the lower part of the housing, a plate partially blocking said aperture, and driving means to impart an oscillatory movement to the plate whereby foreign matter is rolled out of the aperture when said plate is oscillated by said driving means, and cleaning brush means for cleaning each cup prior to the cups entering the mass of seeds in said reservoir.

4,162,745
SUBSTANTIALLY DRIP-PROOF PROBE FOR EXTRACTING TOXIC FLUIDS FROM HERMETICALLY SEALED CONTAINERS

David L. Anderson, Jr., 23799 Monterey, Salinas Hwy. Unit #51, Salinas, Calif. 93901

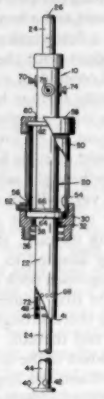
Continuation-in-part of Ser. No. 807,823, Jun. 20, 1977, Pat. No. 4,108,336. This application Oct. 11, 1977, Ser. No. 840,973
Int. Cl.[2] B08B *3/02, 9/08*; B67D *5/02*
U.S. Cl. 222—148 15 Claims

1. In a probe adapted to be employed in extracting a liquid chemical from a shipping container characterized by a pouring spout of a tubular configuration having an external thread, the improvement comprising:

an extensible extraction stinger of a tubular configuration;

coupling means including a collar concentrically related to the stinger having an internally threaded cavity adapted to receive an externally threaded pouring spout in a threaded relationship, and a bore coaxially related to said cavity for

supporting said stinger for reciprocation relative to the cavity adapted to releasably couple the probe to the spout and supporting the stinger for axial extension through said



spout into an extraction relation with a liquid chemical confined within the container; and

means for sealing said stinger prior to the probe being released from the spout.

4,162,746

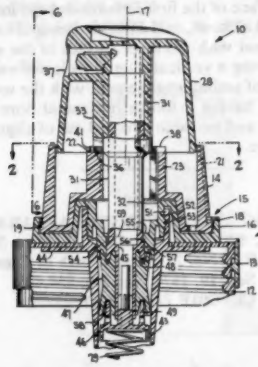
LIQUID DISPENSER LOCKING MEANS

Walter F. Anderson, West Covina, and Ronald A. Meyer, San Dimas, both of Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed Jun. 22, 1977, Ser. No. 809,008

Int. Cl.[2] B65D *47/34*

U.S. Cl. 222—153 **13 Claims**



1. A liquid dispenser, comprising, a container closure member, a locking member mounted on said closure member for rotation about a central axis thereof, a plunger member disposed for reciprocating movement between a lowered position and a spring-biased raised position, said plunger member being rotatable about said central axis and extending through axial openings in said closure and said locking members, said locking member including an annular abutment surrounding said plunger member and extending radially thereof, said plunger member including at least one radially extending rib having a first radial extent and an end surface engageable with said annular abutment for maintaining said plunger member in said raised position, said annular abutment having at least one groove for the reception of said rib upon relative rotation of said locking member and said plunger member thereby permitting said plunger member to be reciprocated to said lowered position, said abutment having a pair of pegs adjacent opposite sides of said groove and another peg spaced from said groove, said pegs extending toward said plunger member with at least portions thereof lying at radial distances from said axis less than said first radial extent of said rib whereby, when said plunger member is locked in said raised position, said plunger member and said locking member are rotatable together in one direction and another as said rib respectively abuts one of said pair of pegs and said another peg, said pair of pegs preventing inadvertent alignment between said rib and said groove so that said plunger member remains in said locked position until said rib is forced past one of said pair of pegs into alignment with said groove upon relative rotation of said plunger member and said locking member.

4,162,747

REFILL CONTAINER FOR PUMPABLE ACTIVE INGREDIENTS OF WASHING AGENTS

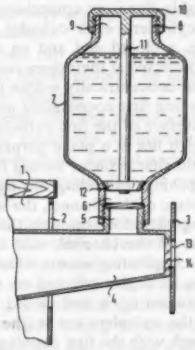
Richard Graf, Berlin, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,620

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622125

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—185 **1 Claim**



1. The refill container for pumpable active ingredients of washing agents to replenish washing agents stored in supply receptables with filling openings in a washing machine for cleaning household articles which washing agents can be conducted into the cleaning chamber of the washing machine by pump devices, comprising a non-collapsible fill container having a pouring spout, the shape and size of which fits exactly the shape and size of the filling opening of the supply receptable of the washing machine and has means for tightly but detachably connecting the pouring spout to the filling opening whereby the refill container is temporarily attached to the filling opening to empty its contents into the supply receptacle of the washing machine and whereby by virtue of the pouring spout fitting exactly the shape and size of the filling opening, ensuring that the contents of the container enter the supply receptable intended for it, wherein said refill container has a filling and venting opening for filling said refill container when empty and for venting said refill container when emptying its contents to refill said supply receptable, and said refill container has a closing device which simultaneously closes said filling and venting opening and the discharge opening of said pouring spout, and wherein the filling and venting opening and the pouring spout opening are lined up opposite each other and wherein the filling and venting opening has an externally threaded nozzle and whereby a screw cap extends over and closes-off said filling and venting opening, and wherein said screw cap has a stay extending into said refill container to a

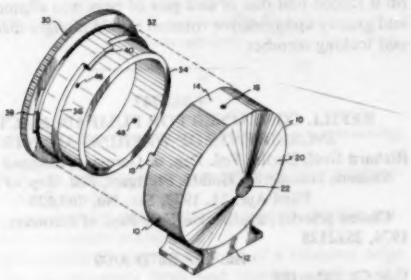
disk plug which closes off the opposite pouring spout opening from the inside.

4,162,748

DISPENSER USING BELLEVILLE DIAPHRAGM

Robert S. Bennett, Easton, Conn., assignor to Risdon Manufacturing Company, Torrington, Conn.

Filed Jan. 13, 1978, Ser. No. 869,040
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—632 8 Claims



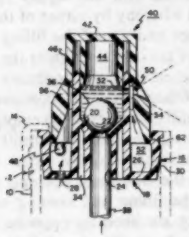
1. A manually operable dispenser comprising: first and second shallow hollow cylinders, each cylinder having a wall with an outer surface, a closed end and an open end, said cylinders being interconnected at their open ends with the first cylinder being disposed concentrically within the second cylinder, the cylinders having first cooperating means defining a channel on the outer surface of the first cylinder which forms a circular arc and which lies in a plane perpendicular to the axes of the cylinders, the first cylinder having first and second oppositely disposed openings extending through the cylinder wall and lying in the plane of the channel, the second cylinder having a third opening extending through the cylinder wall and lying in the plane of the channel, said cylinders being provided with second cooperating means which enables each cylinder to be rotatable through a selected arc with respect to the other cylinder between open and closed positions, said third opening, when the cylinders are in the open position being in registration both with the first opening and the channel and when the cylinders are in the closed position being out of registration with the first opening and the channel, the closed end of the second cylinder defining a belleville diaphragm.

4,162,749

SQUEEZABLE DISPENSER WITH OUTLET CLOSURE

Robert A. Bennett, Easton, Conn., assignor to Risdon Manufacturing Company, Torrington, Conn.

Filed Feb. 27, 1978, Ser. No. 881,440
Int. Cl.[2] B05B *11/04*
U.S. Cl. 222—633 7 Claims



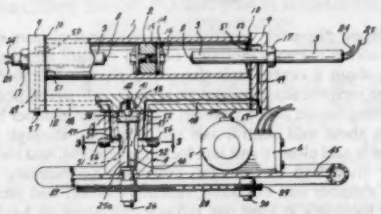
1. A dispenser comprising:
an integral body having a vertical hollow cylindrically shaped first element open at its upper end, said first element having an inverted vertical hollow truncated cone disposed therein intermediate the ends, the cone having an upper and larger opening peripherally secured to the inner wall of the first element and a lower smaller opening, the first element having a first vertical cylindrical bore with an upper end coincident with the lower opening of the cone and a lower end coincident with the lower end of the first element, said body further having a flat horizontal annulus secured at its inner periphery to the outer periphery of the first element at its lower end and extending outward therefrom, said annulus having a second vertical bore extending therethrough said body also having a generally cylindrical vertically elongated second element secured at its lower end to the outer periphery of the annulus and extending upward, the outer surface of the second element being adapted to engage detachably the inner surface of the top open neck of a vertical squeezable flexible container, said first element having a third horizontal bore extending therethrough in a position adjacent but below the upper end thereof;
a ball movable up and down in the first element between the lower end of the cone and the upper end of the first element, the diameter of the ball being smaller than the inner diameter of the first element and larger than the diameter of the smaller cone opening;
a hollow cylindrical dip tube disposed in the first bore, the upper end of the tube being open and coincident with the lower cone opening, the lower end of the tube being open and extending past the lower end of the first element; and
a hollow pull top closed at a top end and extending downwardly, said top having a first vertical hollow cylinder open at its lower end and extending downwardly from said top end into the upper end of the first element, the outer surface of the cylinder slidably engaging the inner wall of the first element, said top further having a hollow generally cylindrical vertical member open at its lower end and secured at its upper end to the top end of the top, said member extending downwardly and slidably between the outer surface of the first element and the inner surface of the second element, said member being always in sealing engagement with the inner surface of the second element and having a vertical plug at its lower end movable into and out of sealing engagement with the second bore, said member having a fourth horizontal bore extending therethrough and movable into and out of alignment with said third bore.

4,162,750

MEASURING AND DISPENSING APPARATUS

Normand Demers, 126 Sherbrooke St., Thetford Mines, and Claude Martin, R.R. No. 2, Garthby, both of Canada

Filed Sep. 19, 1977, Ser. No. 834,485
Int. Cl.[2] G01F *11/06;* F01L *25/08*
U.S. Cl. 222—250 6 Claims



1. An apparatus for dispensing a measured volume of liquid comprising an elongated tubular body having an inside wall surface and end walls closing both ends of said body, a pair of stop rods extending through the respective end walls inwardly within said tubular body, (piston means including) a free piston

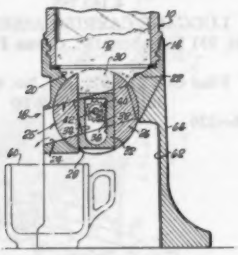
movable longitudinally within said body in fluid-tight contact with said body and inside wall and having abutment surfaces at each side thereof adapted to abut the inner end of the respective stop rods upon the free piston reaching one of two limit positions, said free piston defining two measuring chambers in said body, one chamber on each of the opposite sides of said free piston and between said sides and the respective end walls, each chamber having at least one port, a source of liquid under pressure to be measured and dispensed, a liquid circuit including a control valve comprising a valve body having an inlet port connected to said source of liquid under pressure, an outlet port and two additional ports connected to said measuring chambers, respectively, said control valve further having a valve member movable within said valve body between a first position connecting said inlet port to one of said chambers and said outlet port to the other of said chambers, and a second position connecting said inlet port to said other chamber and said oulet port to said one chamber, an electric driving means to move said valve member between said two positions, and an electric supply circuit for controlling said electric driving means and including two normally open electrical switches parallel connected in series in said supply circuit and mounted at the inner ends of the respective stop rods and both spaced from the abutment surfaces of said free piston when said free piston takes a central position within said cylinder, said free piston upon reaching anyone of said two limit positions causing closing of the associated electrical switch and energization of said electric driving means to move said valve member from one to the other of its two positions thereby reversing the movement of the free piston and causing the opening of the associated switch and stopping of said electric driving means.

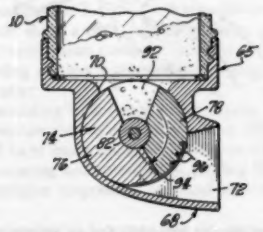
4,162,751

ROTARY MEASURING CHAMBER WITH SIZE ADJUSTMENT

Lillian Hetland, P.O. Box 882 (Park Ave. P.O.), Pomona, Calif. 91766, and Peter R. Schneeweiss, 1630 W. Covina Blvd., #108, San Dimas, Calif. 91773

Filed Jan. 3, 1977, Ser. No. 756,090
Int. Cl.[2] G01F *11/24*
U.S. Cl. 222—293 **6 Claims**





1. A measuring-and-dispensing apparatus to be employed with jar containers to dispense various granulated and powdered materials, wherein said apparatus comprises:

a cap-mounting body arranged to be removably secured to said jar container,

a housing on said cap and having a throat disposed therein wherein said throat includes an inlet opening and a discharge outlet opening,

said inlet opening being formed with downwardly inclined walls whereby a smooth flow of material will enter said compartment,

rotor valve means disposed within said housing,

said rotor valve means comprising a rotor body rotatably mounted within said throat, said body having an enlarged bore disposed therethrough,

a slidable piston adjustably positioned within said bore of said rotor body to define therewith an adjustable volumetric compartment,

said piston carrying volumetric adjustment means including a longitudinal slot, a rack formed in said slot, a pinion gear rotatable within said slot, a shaft on which said pinion gear is mounted having a free end and a knob on the opposite end to adjust and set a predetermined volume of said compartment, and

stop means to control the rotational movement of said rotor valve means.

4. A measuring-and-dispensing apparatus to be employed with jar containers to dispense various granulated and powdered materials, wherein said apparatus comprises:

a cap-mounting body arranged to be removably secured to said jar container,

a housing on said cap and having a throat disposed therein wherein said throat includes an inlet opening and a discharge outlet opening,

rotor valve means disposed within said housing and having an adjustable volumetric compartment,

said inlet opening being formed with downwardly inclined walls whereby a smooth flow of material will enter said compartment,

said rotor valve means comprising first and second segments defining said adjustable volumetric compartment therebetween, a bushing member affixed to the first segment wherein the second segment is rotatable relative to said first segment, a rotatable shaft mounted in said housing and fixed to said bushing whereby said segments rotate with said shaft, said shaft having a head member for manual rotation thereof, and

stop means to control the rotational movement of said rotor valve means.

4,162,752

ROTATING DRUM SPREADER

Larry S. Satterfield, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 5, 1977, Ser. No. 812,699
Int. Cl.[2] B07B *1/24*
U.S. Cl. 222—342 **7 Claims**

1. A device for dispensing powder on a surface, comprising:

housing means forming a powder storage bin having a powder discharge slot formed therein, said slot extending substantially across the width of said powder storage bin;

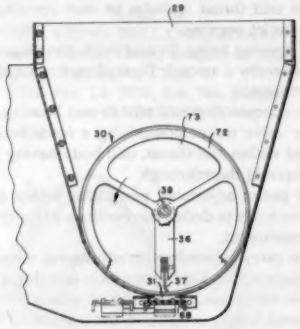
a drum having a foraminous peripheral surface;

means for rotatably mounting said drum within said powder storage bin;

a stationary wiper blade means for forcing powder through the foramina in said drum;

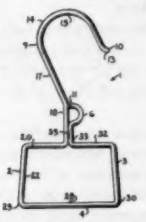
means for mounting said wiper blade within said drum and for maintaining said wiper blade in engagement with the interior of the peripheral surface of said drum in close

proximity to said powder discharge slot, said wiper blade engaging the interior of the peripheral surface of said



drum continuously across the width of said powder discharge slot; and means for rotating said drum.

4,162,753
NECKTIE HANGER
William R. Brown, 4815 W. 61 Ter., Mission, Kans. 66205
Filed Jul. 13, 1978, Ser. No. 924,177
Int. Cl.[2] A47J *51/097*
U.S. Cl. 223—85 **3 Claims**



1. A necktie hanger formed of a continuous wire and comprising:

(a) a curved hook portion including an apex and a downwardly extending hook shank for suspending said hanger from a hanger rack;

(b) a generally vertical coplanar hanger shank merged with said hook shank and vertically aligned with said hook apex;

(c) a substantially straight and horizontal coplanar first spreader portion connected to said hanger shank;

(d) a downwardly and slightly outward extending coplanar first limb having a lower end;

(e) a horizontal, coplanar crossarm having opposite ends, one end being joined to said first limb lower end and extending a distance commensurate with the width of a longitudinal midpointion of a necktie to be draped over said crossarm, said crossarm having a longitudinal midportion vertically aligned with said hanger shank and said hook apex for balance of said hanger;

(f) an upwardly and slightly inwardly extending coplanar second limb having a lower end connected to the other end of said crossarm;

(g) a substantially straight and horizontal coplanar second spreader portion connected to said second limb and extending toward said hanger shank whereby a trapezoidal opening for receipt of neckties is defined by said first and second spreader portion, said first and second limbs and said crossarm;

(h) a coplanar eye connected to said second spreader portion and having portions lying against said hanger shank, said eye and said hanger shank being connected by a weld formation; and

(i) a flexible line connector tied to said hanger through said eye for tethering said hanger to an anchor.

4,162,754
COMBINATION WATCHBAND AND WRITING INSTRUMENT
Charlie Fleming, 1511 Fulton St., Brooklyn, N.Y. 11216
Filed Dec. 22, 1977, Ser. No. 863,212
Int. Cl.[2] G04B *47/00;* **A44C** *5/00*
U.S. Cl. 224—165 **12 Claims**

1. A watchband comprising:

a tubular flexible band member;

coupling means for connecting a watch onto the band member;

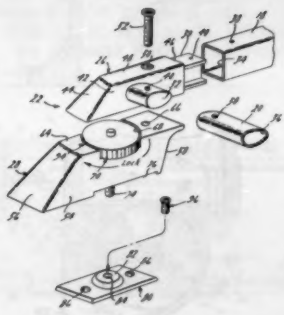
a flexible writing instrument removably disposed in and along the length of said band member with a writing point extending outwardly from one end of said band member;

stiffening means positioned in said band member for providing a pliant and ductile characteristic to the band member, whereby the flexible band member and stiffening means may be bent to conform to the wearer's wrist and easily straightened again for use of the watchband as a pen;

an end cap connected to said one end of said band member;

said end cap being provided with cover means for selectively providing access to said writing point.

4,162,755
LUGGAGE CARRIER ASSEMBLY
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Oct. 27, 1977, Ser. No. 845,846
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—326 **15 Claims**



1. A luggage carrier assembly for an automotive vehicle or the like,

said carrier assembly comprising a pair of spaced parallel article constraining members and a pair of stanchion elements associated with each of said members,

each of said stanchion elements having spaced apart upstanding opposing side portions and a generally horizontally extending portion provided with a vertically disposed opening communicable at its lower end with cooperable mounting means attached to the vehicle upon which the assembly is mounted,

a generally vertically arranged fastening member disposed in part and movable within each of said openings and adapted for engagement with said cooperable mounting means on the vehicle,

said fastening member being vertically movable along a generally vertical axis located between the side portions of the associated stanchion element, and

a manually engageable locking member disposed adjacent said horizontal portion of each of said stanchion elements and operatively connected with the upper end of the fastening member therein, at least one of said side portions having an access opening disposed above said mounting means and below said article constraining members, each of said locking members having an outer peripheral portion projecting laterally through at least one of said access openings and outwardly beyond at least one of said side portions of the associated of said stanchion elements, whereby said peripheral portion of said locking member may be manually engaged and rotated about said axis to thereby vertically move the fastening member connected thereto between engaged and disengaged relationship with said mounting means on said vehicle for selectively securing said stanchion element and said associated article constraining member to said vehicle, and for moving the same relative to said vehicle.

4,162,756

AUTOMATIC STOP MECHANISM

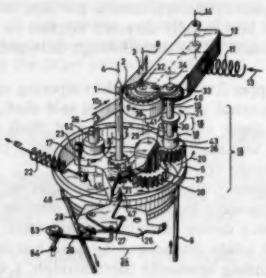
Ghislanus M. A. M. Aldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,024

Claims priority, application Netherlands, Nov. 11, 1976, 7612510

Int. Cl.² B65H *25/32*

U.S. Cl. 226—43 **10 Claims**



1. A stop mechanism for an apparatus having means for driving an article along a path, said mechanism comprising:

a differential mechanism comprising a slip coupling, a primary coupling section, a secondary coupling section, and a zero member;

means for mounting and rotationally urging the primary coupling section during operation of the apparatus independent of local interruption of article movement;

means for mounting and rotationally driving the secondary coupling section responsive to local movement of the article;

means for mounting and connecting the zero member for urging the zero member in first and second opposite directions responsive to the relative difference in rotational speeds of said primary and secondary coupling sections; and

means for performing a control function responsive to movement of the zero member in the second direction;

wherein the slip coupling is a uni-directional coupling interconnecting said primary and secondary coupling sections and permitting relative slip between said sections in one direction only, upon local interruption of article movement said slip coupling preventing relative speed difference between one of said sections and the other section, while continued rotational urging against the primary coupling section moves the zero member in the second direction.

4,162,757

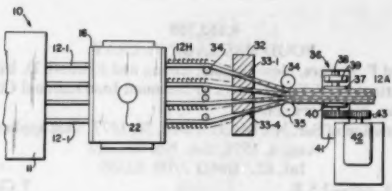
MANUFACTURING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Nov. 24, 1976, Ser. No. 744,505

Int. Cl.² B29F *3/00*

U.S. Cl. 228—1 R **10 Claims**



1. An apparatus for forming a strip of fastening material having a plurality of rows of fastening elements molded integral with and protruding from a surface thereof, said apparatus comprising:

first means for continuously forming and parallely feeding a plurality of strip-like elements in a given direction, wherein each of said strip-like elements contain a row of fastening formations integrally formed with a base strip portion and protruding outwardly from such base strip portion,

second means downstream of said first means for receiving and continuously bringing such strip-like elements into engagement with each other as they are fed with the fastening formations of each strip-like element extending parallel to the fastening formations of the other strip-like elements, and

third means downstream of said second means for edgewise securing said strip-like elements together to provide a unitary formation thereof, which formation contains said plurality of rows of fastening formations protruding outwardly from a surface thereof.

4,162,758

METHOD FOR PRODUCING CLAD STEEL PIPES

Makoto Mikarai, Chiba, Japan, assignor to Asahi Kasei Kogyo Kabushiki-Kaisha and The Japan Steel Works, Ltd., both of Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,132

Claims priority, application Japan, Jul. 26, 1976, 51-88109; Dec. 24, 1976, 51-154911

Int. Cl.² B23K *19/00*

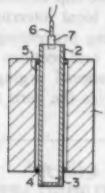
U.S. Cl. 228—131 **9 Claims**

1. A method of producing clad steel pipes using a cylindrically shaped base metal member of a carbon steel and a cylindrically shaped cladding metal member selected from the group consisting of a stainless steel, nickel or a nickel alloy said method comprising:

(a) positioning said base metal member with respect to said cladding metal member such that the cylindrical surfaces of said base metal member and said cladding metal member are opposed to each other;

(b) welding at least one edge portion of the shorter of said

base metal member or said cladding metal member to the cylindrical surface of the other of said base metal member or said cladding metal member; and



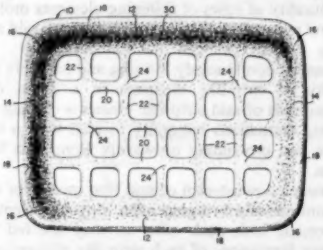
(c) hot rolling, at least one time, said base metal member and said cladding metal member at a temperature of 850° C.–1300° C. with a reduction ratio of at least 15% in said first hot rolling.

4,162,759

FOOD PACKAGING TRAY

Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.

Continuation of Ser. No. 866,131, Dec. 30, 1977. This application Aug. 4, 1978, Ser. No. 931,212
Int. Cl.[2] B65D *1/00, 65/00*
U.S. Cl. 229—2.5 R **7 Claims**



1. In a generally rectangular one-use, throw-away tray molded of inexpensive opaque material and primarily for the packaging of produce in conjunction with a transparent overwrap film-heat sealed thereabout, said tray comprising a pair of upwardly and outwardly inclined opposite side walls, each of said side walls forming a long side of said tray; a pair of upwardly and outwardly inclined opposite end walls, each of said end walls being adjacent to each said side wall and disposed at generally right angles thereto and thereby forming the rectangular configuration of said tray; a peripheral lip extending about said tray at the top of said end and side walls; and bottom wall means for providing visibility to the bottom interior of the tray for supporting the produce at the bottom of said tray; the improvement wherein:

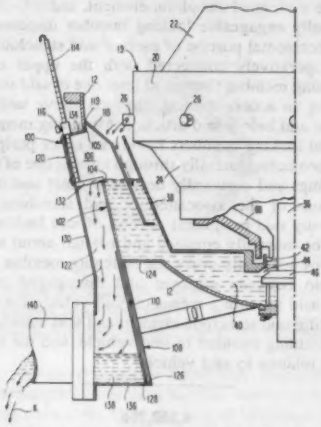
said bottom wall means for providing visibility to the bottom of said tray comprises a plurality of generally flat ribs extending across said tray in at least two directions to define therebetween a plurality of open windows, said ribs constituting window frame structure around each open window and being of generally trapezoidal cross-section with a width approximately two and one-half times as great as the thickness thereof, the upper surface edges thereof being rounded with the terminal peripheral portion of each window frame being located substantially below the upper surfaces of said ribs; said end and side walls extending into a curved annular portion surrounding the open windows, and said annular portion extending smoothly into the ends of said ribs on the interior of said tray.

4,162,760

DISC CENTRIFUGE WITH UNDERFLOW DISCHARGE

John H. Hill, Wayne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 10, 1978, Ser. No. 923,135
Int. Cl.[2] B04B *11/02*
U.S. Cl. 233—19 R **16 Claims**



1. A centrifuge for separating a solids-liquid slurry, comprising:

(a) a rotor, rotatable about a vertical axis, including:

(i) a vertically upstanding central drive shaft;

(ii) a plurality of parallel frusto-conical discs, vertically spaced one from another and secured about said shaft;

(iii) a hollow housing connected to said shaft and rotatable unitarily therewith, surrounding said discs and spaced apart therefrom, said housing having:

(1) a frusto-cylindrical central portion, having a plurality of horizontally directed nozzles for discharge of thickened solids therethrough outwardly of said rotor;

(2) an upper frusto-conical skirt tapering upwardly from said central portion towards said shaft, a portion of said upper skirt proximate said shaft being spaced from said shaft, said space defining a clarified liquid discharge orifice; and

(3) a lower frusto-conical skirt tapering convergently downwardly from said central portion;

(b) a stationary casing surrounding said rotor, for receiving thickened solids discharged by said nozzles, said drive shaft extending upwardly therethrough, a space between said casing and said shaft at said casing upper extremity defining a liquid outlet;

(c) motor means for turning said rotor by rotating said shaft;

(d) a stationary inlet feed tube extending upwardly through said casing and into said housing, said housing being spaced thereabout;

(e) a stationary baffle interposed between said rotor and a lower portion of said casing below said nozzles, connected to said casing interior, separated from said inlet feed tube by an annular space;

wherein said casing lower portion, said baffle and said inlet feed tube define a recycle thickened solids sump and wherein said annular space between said baffle and said inlet tube defines a recycle thickened solids inlet from said sump into said housing;

(f) a toroidal ring moveable vertically about said feed tube, from within said sump to within said recycle solids inlet,

to vary the size of said recycle solids inlet upon ring vertical movement; and

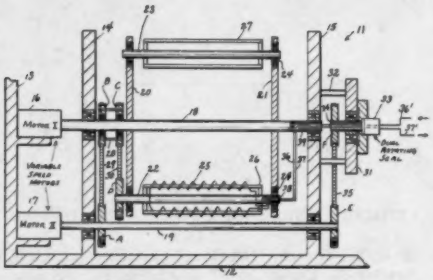
(g) an overflow well, secured to said casing exterior, for holding excess solids material discharged through said nozzles, communicating with said casing interior via an overflow orifice in said casing at a position below the upper extremity of said baffle.

4,162,761

FLOW-THROUGH COIL PLANET CENTRIFUGES WITH ADJUSTABLE ROTATION/REVOLUTION OF COLUMN

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Nov. 30, 1977, Ser. No. 856,172
Int. Cl.[2] B04B *5/02, 9/08*
U.S. Cl. 233—24 **10 Claims**



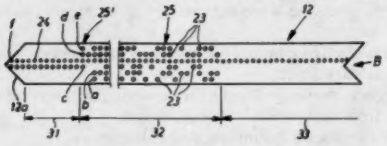
1. A flow-through coil planet centrifuge having a central rotational axis, comprising, two independent stationary motors one of which is mounted out of the central rotational axis, centrifuge rotor means rotatably mounted on the central rotational axis, means drivingly coupling one of said motors to said rotor means, a coiled tubular column and including an inlet and an outlet end both extending outside the rotor means along the central rotational axis, means rotatably mounting said column on said rotor means for rotation on an axis parallel to and spaced from the central rotational axis, means to feed fluid into the inlet end of said tubular column and out the outlet end during operation of the centrifuge, and planetary means drivingly coupling the other motor to said coiled column.

4,162,762

DATA PROCESSING MACHINE, ESPECIALLY CIPHERING EQUIPMENT

Peter Frutiger, Sonnhalde 18, Wangen, Switzerland

Filed Nov. 2, 1977, Ser. No. 847,788
Claims priority, application Switzerland, Nov. 10, 1976, 14162/76
Int. Cl.[2] G06K *7/10, 21/04;* H04L *15/12*
U.S. Cl. 235—461 **7 Claims**



1. A perforated tape reader comprising:

a scanner adapted to scan teleprinter perforated tapes having a number of essentially parallel information tracks formed by information perforations and a feed track formed by feed perforations, said feed track being essentially parallel to said information tracks, the size of said information perforations being different than the size of said feed perforations, said scanner being adapted to generate output signals indicative of the relative magnitude of each of said perforations as said perforations pass said scanner;

means for advancing said perforated tape past said scanner; and

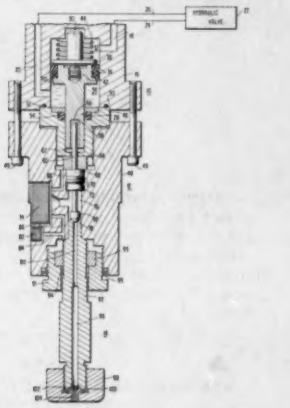
circuit means responsive to said output signals for determining which of said scanned tracks constitute said information tracks and which of said scanned tracks constitutes said feed track as a function of the size of said information and feed perforations.

4,162,763

WATER JET VALVE ASSEMBLY

Bobby L. Higgins, Dallas, Tex., assignor to Camsco, Inc., Richardson, Tex.

Filed Jan. 10, 1978, Ser. No. 868,244
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—101 **10 Claims**



1. A valve assembly comprising:

hydraulic switch means, piston means moveable in response to said hydraulic switch means, means to bias said piston means in one direction;

input means for receiving a source of high-pressure liquid, a cavity disposed in a liquid transfer relationship with said input means, a valve stem of a first material disposed in said cavity and extending to said piston means, said stem having a tip of a second material to effect a long life seal;

seal means disposed between said piston means and said cavity, said seal means having an annular seal around said valve stem of a solid material that will deform under the influence of high-pressure liquid; and

output means coupled to said cavity, said output means having a valve seat for engaging said valve stem when said piston is pushed in said one direction, an expansion section for obtaining a laminar flow of high-pressure liquid, and a nozzle for shaping said flow of liquid upon release.

4,162,764

PERSONNEL AIR COOLING DEVICE

Robert K. Millsap, 500 E. 1st, Pana, Ill. 62557

Filed Oct. 18, 1977, Ser. No. 843,435
Int. Cl.[2] B05B *9/08*
U.S. Cl. 239—152 **3 Claims**

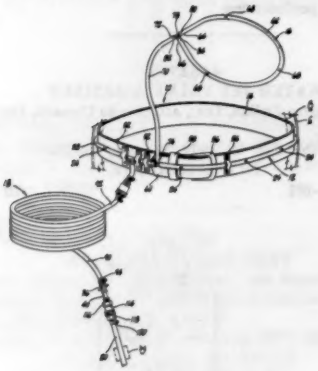
1. A personnel temperature control device for use with a high pressure outlet, the device comprising:

(a) waist belt means,

(b) elongate air tube means, including:

1. connection means connected to the waist belt means,

2. a neck-encircling loop portion adapted to hang freely about the neck, and
3. a portion connected between the neck-encircling portion and the connection means,
4. at least the neck-encircling loop portion including a plurality of longitudinally spaced air outlet apertures for expelling air outwardly in a direction transverse to the longitudinal axis of the air tube means onto the upper body of the wearer.



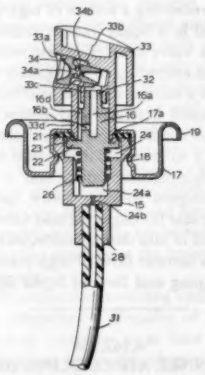
(c) an extension air line means including opposed ends, one of said ends being connected to said connection means, and the other end being connected to the high pressure outlet, and
(d) regulator valve means at one end of the extension air line means for controlling air pressure supply to air tube means.

4,162,765

AEROSOL DISPENSER UTILIZING CO_2 AS PROPELLANT

Pasquale R. Riccio, 54 Pelham Rd., Salem, N.H. 03079

Filed Jan. 24, 1978, Ser. No. 871,983
Int. Cl.[2] B05B *7/32*
U.S. Cl. 239—337 **2 Claims**



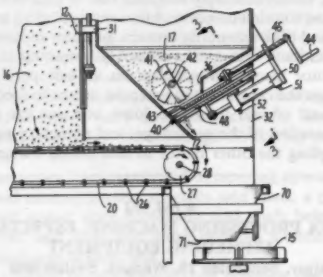
1. An aerosol type dispensing package comprising: a container; a dispensing valve means on said container having a nozzle means on the outside of the container with a passage extending longitudinally therethrough and at least one lateral passage opening into said longitudinal passage, a main flow path extending part way through said valve means from within said container, valve actuating means forming part of said dispensing valve means and including obturating means obturating the end of said main flow path within said valve means and movable to the open position upon actuating of said valve actuating means; one flow path extending from said end of said main flow path through said dispensing valve means from said obturating means to said longitudinal passage and a second flow path extending from said end of said main flow path through said dispensing valve means from said obturating means to said lateral passage, dip tube means extending from said valve means to near the bottom of said container and being in communication with said main flow path where it is connected to said valve means; a body of a solution of a product to be dispensed in said container and filling said container to a level below the top of the container for leaving a gas space in the upper part of said container above said body of solution; and a carbon dioxide propellant under pressure and dissolved in said solution and in gaseous form in the space in said container above said body of solution.

4,162,766

VEHICULAR SPREADER FOR ICY ROADS AND THE LIKE

Dale K. Ten Broeck, 1168 Douglas La., Redding, Calif. 96001; Stanley N. Cuson, 35757 Ballantine Pl., Fremont, Calif. 94536, and Hal K. Sorenson, 4560 Lawrence Dr., Roseville, Calif. 95678

Filed Sep. 16, 1977, Ser. No. 833,886
Int. Cl.[2] E01H *5/00*; B01F *15/02*
U.S. Cl. 239—656 **6 Claims**



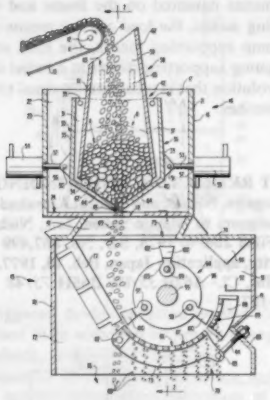
1. In a vehicle for applying materials to icy or snow-covered roadways, having a storage tank carrying a first material and a spreader for applying said first material to the roadway, the improvement comprising:
- auxiliary storage means mounted behind said storage tank for carrying a second material to be applied to the roadway,
- first discharge means for removing said materials from said storage tank,
- second discharge means for removing said second material from said auxiliary storage means,
- mixing means for mixing said materials,
- said second discharge means being positioned to discharge said second material on said first discharge means upstream of said mixing means, and
- control means for regulating the proportions of said first and second materials discharged from said storage tank and from said auxiliary storage means prior to said materials being applied to the roadway by said spreader.

4,162,767

IMPACTING CRUSHER WITH VARIABLE FLOW FEED DISTRIBUTOR

William F. Hahn, Devon, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.

Filed Nov. 7, 1977, Ser. No. 849,142
Int. Cl.[2] B02C *13/286*
U.S. Cl. 241—30 27 Claims



1. Apparatus comprising in combination an impacting crusher and a feed distributor; said impacting crusher having an inlet, a rotor within the housing and an outlet, the rotor comprising a shaft having rotating impact members mounted thereon and extending outwardly from the shaft along a given length of said shaft to define a relatively wide rotor, the width of said inlet being substantially equal to or greater than the width of the rotor; said distributor including an enclosure defined by confining means for surrounding an inventory of material laterally and from beneath, said confining means including a moveable supporting member defining a portion of the enclosure and being positioned to bear at least a portion of the weight of the inventory, said enclosure being openable to define an opening which is presented to the rotor, is elongated in a horizontal direction generally parallel to the rotor axis, is about as long as the width of the rotor, is positioned with its ends substantially above the ends of the rotor and is of substantially uniform width across the width of the rotor, said moveable member being connected with closing means having the property of exerting sufficient closing force on said moveable member to keep the entire length of said opening covered by said inventory while said inventory is flowing through the opening, and being responsive to the inventory present in the enclosure for moving said moveable member and respectively decreasing and increasing the width of said opening in response to decreased and increased inventory, whereby such apparatus will cause the material passing through said opening to be distributed substantially uniformly across the length of the opening, so that the side and central portions of the rotor will receive substantially equal quantities of the material over an extended period of operation.

4,162,768

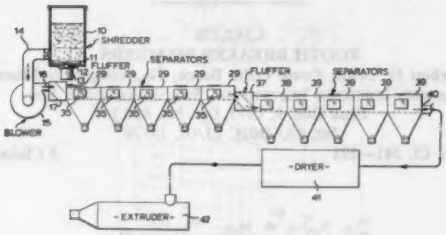
APPARATUS FOR SEPARATING PAPER FIBRES FROM PORTIONS OF POLYETHYLENE FILM MATERIAL

Blaine Froats, 210 Morrison Rd., Oakville, Ontario, Canada

Filed Nov. 8, 1977, Ser. No. 849,548
Int. Cl.[2] B02C *23/18, 23/20*
U.S. Cl. 241—45 8 Claims

1. Apparatus for stripping damp paper fibers from portions of polyethylene film comprising:

a shredding device for converting said polyethylene sheet/-paper fibre to substantially uniform balls of paper fibre and small portions of polyethylene film, the uniform balls of paper fibre having an average diameter of about 2 mm; means including an air blower for entraining said balls and film portions in a stream of air and projecting them along a predetermined pathway; a first plurality of impact surfaces in said pathway to impact said paper fibre balls and polyethylene film to strip said paper fibres from said polyethylene film portions; a cascade of baffle separators having alternate high velocity passages and low velocity chambers in series to provide air entrainment of said poly-



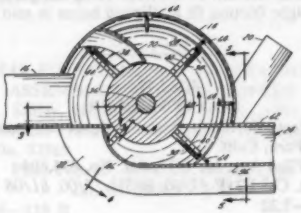
ethylene film portions while allowing said paper balls to fall out in the low velocity chambers, a screen defining a bottom wall for said cascade of baffle separators; gravity collection chambers beneath the screens of each of said low velocity chambers to receive the denser, damp paper fibre balls that fall out through the screen in said low velocity chamber; means to remove the paper fibre balls from the collection chambers, and means to collect the polyethylene portions at the downstream end of the cascade of baffle separators.

4,162,769

WHOLE TREE CHIPPER

Joseph A. Lapointe, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 855,073, Nov. 25, 1977, which is a continuation-in-part of Ser. No. 677,317, Apr. 15, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,795
Int. Cl.[2] B02C *18/22, 23/08*
U.S. Cl. 241—68 12 Claims



1. A whole tree chipper comprising a housing having a rotor therein, said housing including a circumferential wall and chip chambers formed at each axial end thereof; said rotor being formed by a pair of substantially identical axially aligned frustro-conical hollow discs connected together at their minimum diameter axial ends and rotatable about their common axis, at least one knife projecting from the conical outer face of each disc; a slot through said conical outer face adjacent said knife for directing chips cut by said knife to the interior of said hollow disc and into said chip chamber at the adjacent axial end of said rotor; means to rotate said rotor; an inlet through said circumferential wall for feeding tree lengths with twigs and branches thereon substantially longitudinally through said inlet and against said conical faces of said rotor; a debris outlet through said circumferential wall; a debris chamber in said

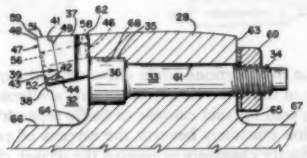
housing between said circumferential wall and said conical faces of said discs, means separating said debris chamber from said chip chambers, said debris chamber extending between said inlet and said debris outlet, said debris outlet connected with said debris chamber, means on said rotor for ejecting debris from said debris chamber through said debris outlet, and a chip outlet from each of said chip chambers for ejecting the chips from said said chip chamber whereby chips are ejected from said chipper separate from debris, said debris including at least some of said twigs and branches.

4,162,770

TOOTH BREAKER MEMBERS

Herbert H. Lewis, Ponte Vedra Beach, Fla., assignor to Montgomery Industries International, Inc., Jacksonville, Fla.

Filed Dec. 9, 1977, Ser. No. 859,147
Int. Cl.[2] B02C *13/06, 13/28*
U.S. Cl. 241—191 **4 Claims**



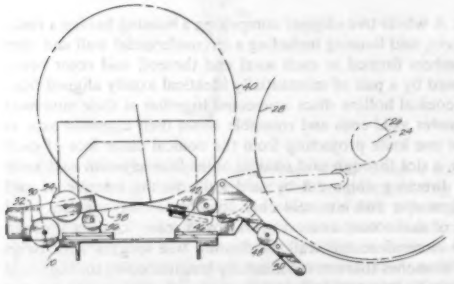
1. A breaker tooth member comprising a metal head having an integral rearwardly projecting mounting shank provided with a threaded end, said head being formed opposite said shank with a flat front surface extending at an angle to the axis of said shank, means forming a forwardly open recess at said front surface having a flat back face intersecting a bottom ledge provided all along its forward portion with a lip and having a downwardly displaced region between the lip and said back surface for defining a locking formation, and an integral harder wear resistant metal sharp edged element mounted in said recess flush against said back face, said element being correspondingly formed along its bottom edge to interfit and interlock with said ledge, the front surface of said lip and the forward surface of said element being flat and substantially in the plane of said head front surface, and means for securing said element on the head comprising a plurality of pins having tight friction fit in aligned bores in said head and element.

4,162,771

ROD TENSIONER

Robert L. West, Portland, Oreg., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Aug. 15, 1977, Ser. No. 824,404
Int. Cl.[2] B21F *17/00;* B65H *77/00, 81/08*
U.S. Cl. 242—7.22 **7 Claims**



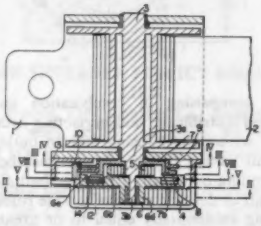
1. Apparatus for applying tension to a filament while feeding the filament, comprising a frame, a circular member, means rotatably supporting the circular member on the frame for rotation about its axis of revolution, the filament passing around at least a portion of said member, a hydraulic pump, means supporting the pump, said pump supporting means being rotatable about the axis of revolution of the circular member, drive means connecting the circular member to the pump for driving the pump by rotation of the circular member, load sensing means mounted on the frame and engaging the pump supporting means, the load sensing means limiting rotation of the pump supporting means, the load sensing means engaging the pump supporting means at a radial distance from said axis of revolution that is substantially equal to the radius of the circular member.

4,162,772

SEAT BELT RETRACTING AND WINDING DEVICE

Toshiaki Shimogawa, Nishio, and Satoshi Kuwakado, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 6, 1978, Ser. No. 867,499
Claims priority, application Japan, Feb. 18, 1977, 52-19241[U]
Int. Cl.[2] A62B *35/00;* B65H *75/48*
U.S. Cl. 242—107 **7 Claims**



1. A seat belt retracting and winding device comprising
a frame;
a winding reel rotatably supported by said frame;
spring means connected between said frame and said winding reel and including a first spring and a second spring, said winding reel being adapted to wind thereon a seat belt with a spring force of at least one of said first and second springs;
means operable in response to the rotation of said winding reel for controlling said spring means to operate selectively under a first operative condition and a second operative condition exerting larger and smaller spring forces, respectively, on said seat belt, whereby the winding force exerted on said seat belt is reduced when said spring means is operated under said second operative condition; and
impact relaxing means disposed between said first and second springs and slowly releasing the compression of one of said first and second springs when the operative condition is changed over from the second condition to the first condition under predetermined rotation of the reel to wind the seat belt.

4,162,773

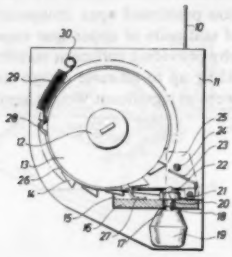
DEVICE FOR USE IN EMERGENCY LOCKING MECHANISM FOR WEBBING-TYPE SEAT BELTS

Jan-Olof Wallin, Ellerau, Sweden, assignor to Irvin Industries, Inc., Sweden

Filed Apr. 10, 1978, Ser. No. 894,767
Claims priority, application Sweden, Apr. 22, 1977, 7704686
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **12 Claims**

1. A device for use in emergency locking of webbing-type vehicle safety belts, comprising

a casing adapted to be mounted in a vehicle,
a spindle rotatable on said casing and having thereon a webbing-type safety belt,
a ratchet wheel secured to said spindle for rotation therewith,
a locking device interlockable with said ratchet wheel to lock said spindle against rotation in a belt unwinding direction,



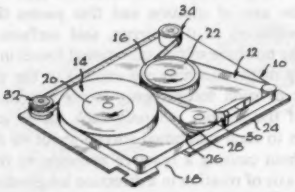
a vehicle-triggered device mounted on said locking device and disposed to be activated by pre-set changes of motion of said vehicle, and
an arm connected to said locking device and engageable with the ratchet-wheel upon activation of said vehicle triggered device whereby force is transferred to the arm by the continued rotation of the ratchet-wheel and is passed on by said arm to the locking device which, in turn, is caused to interlock with the ratchet-wheel.

4,162,774

BELT DRIVE CARTRIDGE

George W. Bowers, Hayward, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Oct. 17, 1977, Ser. No. 842,542
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—192 10 Claims



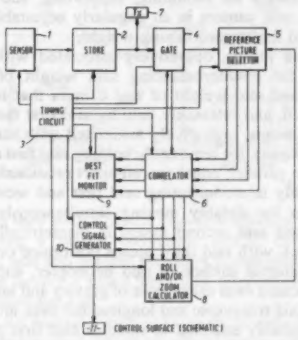
9. A belt drive tape cartridge comprising:
a tape with end portions formed in a pair of rolls;
a drive roller;
at least one guide roller;
a belt extending about said drive roller and guide roller, and against said tape rolls; and
a riding roller having a peripheral portion of elastomeric material bearing against said guide roller, whereby to produce a hysteresis energy loss and therefore drag on the belt which, in turn, produces tape tension.

4,162,775

TRACKING AND/OR GUIDANCE SYSTEMS

Roger Voles, London, England, assignor to E M I Limited, Hayes, England

Filed Nov. 19, 1976, Ser. No. 743,343
Claims priority, application United Kingdom, Nov. 21, 1975, 48068/75
Int. Cl.[2] F42B *15/02;* F41G *9/00, 7/00;* F42B *15/10*
U.S. Cl. 244—3.17 3 Claims



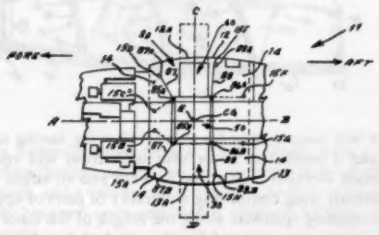
1. A tracking and/or guidance system for a vehicle, the system comprising a sensor providing electrical signals forming representations of a field of view of a region towards which the vehicle is travelling, a reference picture selector deriving, a plurality of portions from the said electrical signals, the portions forming reference representations of respective portions of a preselected area of the said field view, a correlator circuit correlating each reference representation with a further representation, subsequently provided by the sensor, in each of a plurality of different positions relative to the further representation, means ascertaining the respective positions of best fit of the reference representations with corresponding portions of the further representation, and means utilising the ascertained positions to rotate and/or change the scale of the reference representations to compensate for rotational misalignment and/or changes of scale between the representation from which the reference representations were derived and the further representation.

4,162,776

AERIAL PHOTOGRAPHY CAMERA MOUNT ASSEMBLY FOR A HELICOPTER

Clarence E. Sibley, HQ26TRW, Box 1331, APO New York, N.Y. 09860, and Francisco C. Sablan, 13 Woodland Dr., Mary Esther, Fla. 32569

Filed Feb. 15, 1978, Ser. No. 877,936
Int. Cl.[2] B64D *47/08*
U.S. Cl. 244—118 R 8 Claims



1. An aerial photography camera mount assembly, adapted for use with an aerial photography camera having weight, and with a helicopter having a starboard side with an opening

therein, a port side with an opening therein, a planar horizontal internal surface located between said openings, a first plurality of cargo tiedown rings affixed to said horizontal internal surface, and a center of gravity located in said horizontal surface and having a longitudinal axis and a transverse axis that intersect and from an intersection, that are perpendicular to each other, and that are coplanar with said horizontal internal surface, and wherein said transverse axis is situated between and aligned with said starboard and port side openings, comprising:

a. a first means for mounting, supporting, and releasably holding said camera in an angularly adjustable position, with said first means having weight;

b. a second means, operatively associated with said first means, for counterbalancing said weight of said first means, and said weight of said camera that is mounted, supported, and releasably held by said first means;

c. a third means, operatively associated with said first and second means, for removably holding said first and second means in parallel, equal spaced-apart relationship, and for detachably interconnecting said first and second means, and also for slidably moving simultaneously said first means and said second means in diametrically opposed directions, with said third means positioned on said horizontal internal surface of said helicopter, and also centrally located over said center of gravity and said intersection of said transverse and longitudinal axes, and additionally releasably attached to some of said first plurality of cargo tiedown rings;

d. and, a fourth means, releasably connected to said third means, and in selective cooperative engagement with said first means and said second means, for preventing inadvertent jettisoning of said first means, of said camera releasably held by said first means, and of said second means, from said helicopter;

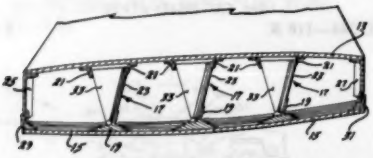
whereby when said helicopter is in stable flight, and said first means with said releasably held camera are extended and are retracted through one of said side openings in said helicopter, and said second means is extended and is retracted through said other of said openings in said helicopter, said center of gravity and said horizontal and transverse axes remain in a stable condition, and said helicopter remains in stable flight.

4,162,777

CANTED SPAR WITH INTERMEDIATE INTERCOSTAL STIFFENERS

William W. Gilbert, III, and Eduardo W. Gomez, both of Fort Worth, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,131
Int. Cl.[2] B64C *3/22*
U.S. Cl. 244—123 **3 Claims**



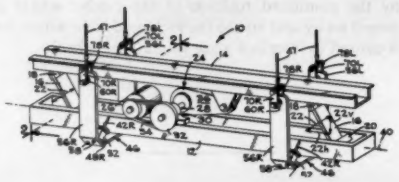
1. A box construction for an aircraft wing having an upper skin and a laminated lower skin with front and rear spars positioned therebetween at the forward and aft edges thereof, said aircraft wing comprising a plurality of pairs of upper spar caps extending spanwise along the length of the inner surface of the wing upper skin and fixedly attached thereto, said pairs of upper spar caps being spaced chordwise across the wing structure and canted to the upper surface thereof, a plurality of lower spar caps extending spanwise along the length of the inner surface of the wing lower skin and fixedly attached thereto and canted to the surface thereof, each of said lower spar caps being positioned under and midway between each pair of said upper spar caps, a spar web fixedly attached between each of said lower spar caps and one of each of said pairs of upper spar caps and extending spanwise along the length of the wing structure, and a plurality of intercostal stiffeners at spaced intervals spanwise along the length of the wing structure wherein each intercostal stiffener is of substantially triangular configuration positioned apex downwardly between the other of each of said pairs of upper spar caps and one of said spar webs thereby providing sufficient stabilization to prevent upper skin buckling up to ultimate design stress with a minimum of shear webs at significant weight savings.

4,162,778

VIBRATING MACHINE SUSPENSION

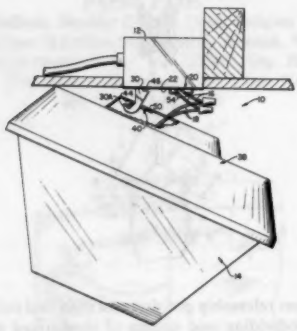
Robert E. Kraft, Indiana Borough, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 1, 1977, Ser. No. 820,982
Int. Cl.[2] F16F *15/00*; B65G *27/08*
U.S. Cl. 248—610 **11 Claims**



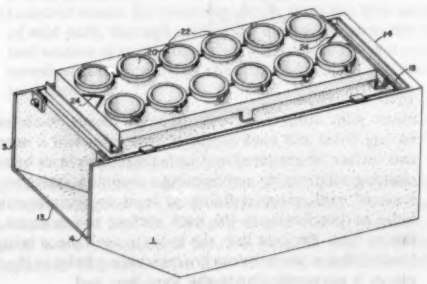
1. A suspension for mounting a vibrating machine to supports, said suspension comprising a plurality of U-shaped stirrups that are spaced longitudinally of the machine, each stirrup extending transversely of the machine between opposed supports, each stirrup being mounted for pivotal movement about its own axis of rotation that extends transversely of the machine, each stirrup having a center of percussion in relationship to the axis of rotation of the individual stirrup, each stirrup having surfaces at locations spaced below its axis of rotation, said surfaces being located to intersect an axis that extends parallel to the axis of rotation and that passes through the center of percussion of the stirrup, said surfaces providing support for the machine so that vibrational forces in a direction longitudinally of the machine are applied to the stirrup with the resultant of such forces being located at the center of percussion of the stirrup, whereby such forces impart rotational motion to each individual stirrup about its own axis of rotation without causing a reactive pressure on the supports adjacent the axis of rotation in a direction longitudinally of the machine, each U-shaped stirrup having a center of gravity that is spaced perpendicularly from the axis of rotation of the stirrup, said machine supporting surfaces being located to intersect a plane wherein the axis of rotation and the center of gravity of the stirrup are contained, said surfaces being located on the side of the center of gravity opposite from the axis of rotation, the perpendicular distance between the axis of rotation and the axis passing through the center of percussion being equal to $I_o/\bar{a}\ M$ where I_o is the amount of inertia of the stirrup taken about the axis of rotation, $\bar{a}$ is the distance from the center of gravity to the axis of rotation, and M is the mass of the stirrup.

4,162,779
OUTLET BOX MOUNTING DEVICE
Frank Van Steenhoven, Killingworth, and Thomas D. Hirt, Meriden, both of Conn., assignors to The Miller Company, Meriden, Conn.
Filed Dec. 14, 1977, Ser. No. 860,596
Int. Cl.[2] B42F 13/00
U.S. Cl. 248—343 15 Claims



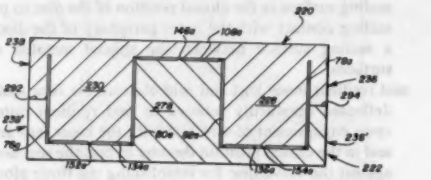
1. A light fixture mounting device comprising a service outlet box having a bottom cover plate, light fixture suspension means on the bottom cover plate providing temporary light fixture suspension, a light fixture having an upper housing in underlying relation to the bottom cover plate, and light fixture locking means including a bolt keeper depending from the bottom cover plate and releasable slide bolt means on the upper housing, the bolt keeper and slide bolt means cooperating and providing permanent light fixture mounting when the upper housing of the light fixture is in aligned confronting relation to the bottom cover plate.

4,162,780
ICE CUBE SERVICE
Armand T. Rankin, New Albany, Ind., assignor to Stone City Products, Inc., Bedford, Ind.
Filed May 20, 1977, Ser. No. 798,845
Int. Cl.[2] F25C 1/24
U.S. Cl. 249—127 3 Claims



1. An ice cube tray comprising two longitudinally extended rows of less than half spherical flexible compartments attached to and penetrating through a flexible tray bed, wherein distortion means are provided on the top and on the bottom of the tray bed, said distortion means being attached in both places to sides of the compartment and the tray bed.

4,162,781
MOLD FOR PLASTIC COLLAPSIBLE ARTICLE CARRIER
Paul J. Morcom, Rte. 1, Box 235, Henderson, Tex. 75652
Division of Ser. No. 667,679, Mar. 17, 1976, Pat. No. 4,113,087.
This application Apr. 24, 1978, Ser. No. 899,263
Int. Cl.[2] B29C 1/00; B29F 1/06
U.S. Cl. 249—144 5 Claims

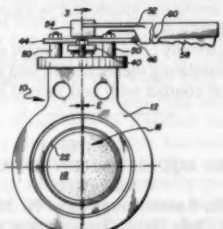


1. A mold used with a plastic injection molding machine for manufacturing a plastic collapsible article carrier having hinged end, side and bottom members comprising:

a first die having a first plurality of alternating cavity and core members; and

a second die having a second plurality of alternating cavity and core members which are offset from said first plurality of members, such that when said first and second dies are mated with one another the core members of said first die align and mate with said cavity members of said second die and said cavity members of said first die align and mate with said core members of said second die to form the collapsible article carrier which has side walls vertically offset from one another, said core members including planar end surfaces, said planar end surfaces including first and second convex hinge-forming projections parallel to one another and extending from opposite edges of said planar end surfaces, wherein said projections mold the hinged connections of the side and end walls of the collapsible article carrier.

4,162,782
SEAL ASSEMBLY FOR BUTTERFLY VALVE
Ronald D. Wilkins, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Apr. 10, 1978, Ser. No. 894,787
Int. Cl.[2] F16K 25/00
U.S. Cl. 251—173 23 Claims



1. In a butterfly valve having a valve body with a flow passage therethrough, an annular groove in the body about the flow passage, and a valve disc mounted in the flow passage for movement between open and closed positions relative to the flow passage;

an improved seal assembly mounted in said groove for sealing against the outer periphery of the valve disc in the closed position thereof, said seal assembly comprising a metallic body and an elastomeric face seal;

said metallic body including a pair of outer resilient legs having outer ends contacting the bottom of the groove and a pair of spaced inner legs having outer ends contacting the outer periphery of the valve disc in the closed position of the valve disc to provide metal-to-metal sealing contact with the outer periphery of the disc along two spaced metallic sealing surfaces formed by the ends of the inner legs, said elastomeric face seal being positioned between the spaced inner legs and contacting the disc sealing surface in the closed position of the disc to provide sealing contact with the outer periphery of the disc along a sealing surface between the spaced metallic sealing surfaces;

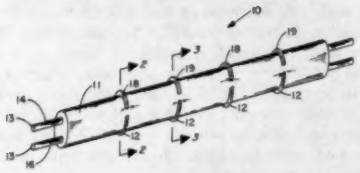
said resilient inner legs and said elastomeric face seal being deflected outwardly relative to said resilient outer legs upon engagement of said disc with the inner legs and face seal in the closed position thereby to bias the seal assembly against the valve disc for establishing the three aforementioned sealing surfaces between the seal assembly and the outer periphery of the valve disc in the closed position of the valve disc.

4,162,783

ELECTRIC FENCE CABLE ASSEMBLY

V. William Crist, Jr., Box C, Wessington Springs, S. Dak. 57382

Filed Mar. 31, 1978, Ser. No. 892,233
Int. Cl.[2] A01K *3/00*
U.S. Cl. 256—10 **5 Claims**



1. An improvement in an electrified cable assembly for use with electrically charged fences having a fence charger for providing an electric charge, the improvement comprising:

a first conductor electrically connected to the fence charger;

a second conductor electrically connected to ground;

unitary insulating means disposed about said first and second conductors such that said conductors are electrically insulated from each other and the environment;

a first electrically conductive contact unit disposed proximate said insulating means and in electrical contact with said first conductor; and

a second electrically conductive contact unit disposed proximate said insulating means distant said first conductor and in electrical contact with said second conductor.

4,162,784

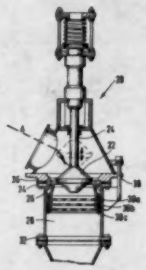
PRESSURE EQUALIZATION APPARATUS AND METHOD

Edouard Legille, Luxembourg; Rene N. Mahr, Howald-Hesperange, and Carlo Heinz, Luxembourg, all of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Filed Feb. 18, 1977, Ser. No. 770,193
Claims priority, application Luxembourg, Mar. 8, 1976, 74505
Int. Cl.[2] F27B *11/12*
U.S. Cl. 266—176 **9 Claims**

1. In a pressure equalization system for use with a shaft furnace charging installation, the pressure equalization system including a valve and a tubular conduit in series relation to the valve and defining an axis, said tubular conduit providing for the flow of a stream of pressurized gas including entrained particulate material therethrough, the improvement comprising:

a movable tubular housing, said tubular housing having an axis and defining a segment of the conduit, said movable tubular housing being pivotal with respect to the conduit to translate said housing axis in a direction transverse to the axis of the conduit to provide access to the interior of the housing; and



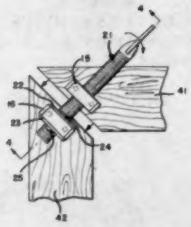
disc means releasably positioned within said tubular housing for subdividing said stream of pressurized gas including entrained particulate material delivered thereto into a plurality of jets, said disc means being formed of a highly wear-resistant material and being impacted by the entrained particulate material when the stream of pressurized gas is delivered through the tubular housing to thereby reduce the speed and energy of the entrained particulate material and to reduce the wear on the portion of the conduit downstream of said disc means.

4,162,785

MITER CLAMP

George P. Johnson, 1951 Hollywood Pkwy., York, Pa. 17403

Filed Mar. 9, 1978, Ser. No. 884,763
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—41 **1 Claim**



1. In combination:

a miter joint comprising two mitered pieces, each piece having front and back surfaces, two sides and a mitered end surface, the mitered end surfaces of the pieces being in abutting relationship and forming a common joint line, the back of each piece defining at least two pin-receiving holes perpendicular to the back surface and at equal distances from the joint line, the holes in each piece being so located that a line between corresponding holes in the two pieces is perpendicular to the joint line; and

a clamp comprising first and second members mounted on a common cylindrical shaft for relative movement toward and away from each other in the axial direction of the shaft, first and second sets of parallel coextensive pins mounted on the first and second members respectively and so oriented as to define first and second planes perpendicular to the axis of the shaft, and means for applying

force in the axial direction of the shaft to move the first and second members toward each other and to hold the members in axial position with respect to each other,

wherein the first set of pins is received in the holes in the first mitered piece and the second set of pins is received in the holes in the second mitered piece.

4,162,786

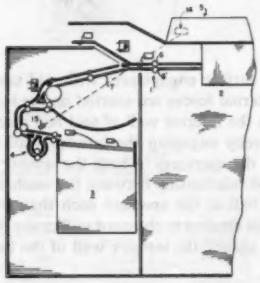
JOB SEPARATION BY A SKEWED TROUGH IN THE PAPER PATH

Michael K. Bullock, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 727,873, Sep. 29, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,618

Int. Cl.[2] B65H *29/58*

U.S. Cl. 271—64 **27 Claims**



1. Apparatus for offsetting sheets laterally with respect to their path of travel in a predetermined direction comprising:

(a) feeding means for feeding sheets in a predetermined direction and with predetermined orientation to said direction, first in one plane along a first section of said path and then along a second section of said path, the first and second section of said path being disposed in the same plane, said sheets being in said predetermined orientation, but offset, when resident in said second section of said path;

(b) trough shaped guide means connecting said two sections and extending out of said plane in skewed relation to said predetermined direction, said guide means comprising a plurality of serially disposed and individual skewed turns, each individual turn of which is formed about an axis skewed relative to said predetermined direction, and each such axis being parallel with each other such axis and being containable within a plane parallel to a sheet while it is in the first section of said path; and

(c) control means for directing sheets from the first section of said path, through said guide means and onto the second section of said path as they are being fed in said predetermined direction along the first and second sections of said path.

4,162,787

SHEET SORTING DEVICE

Reiji Shirahase, Tokyo, and Shigehiro Komori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 754,171, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 612,723, Sep. 12, 1975, abandoned. This application Apr. 17, 1978, Ser. No. 897,055

Int. Cl.[2] B65H *31/24*

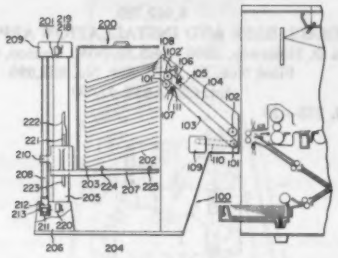
U.S. Cl. 271—173 **4 Claims**

1. A sheet sorting device for collecting sheets supplied from a fixed discharge opening, comprising:

a tray casing, and a plurality of trays for receiving sheets thereon, wherein each of said trays is mounted at a first edge thereof for pivotal movement, and wherein said sheets are received at a second edge of said trays, said first and second edges being opposed to each other and said trays slanting upwardly toward said first edges thereof;

a plurality of displacement transmission means pivotally mounted on said tray casing for respective engagement with said trays;

means for moving said tray casing to successively align each tray with said fixed discharge opening; and



control means for pivoting a plurality of said displacement transmission means to pivotally move a plurality of said trays, simultaneously, to widen the space between the second edges of adjacent trays at the sheet inlet opening for each tray, as each said tray is successively aligned with the fixed discharge opening.

4,162,788

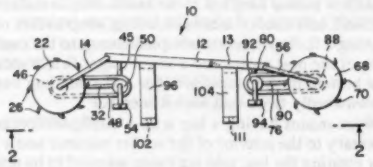
SWIMMING AND EXERCISING APPARATUS

Gerard Turnier, 61-35 98th St., Rego Park, N.Y. 11374

Filed Jul. 18, 1977, Ser. No. 816,336

Int. Cl.[2] A63B *35/04*

U.S. Cl. 272—71 **4 Claims**



1. A swimming and exercising apparatus comprising a substantially flat body supporting section, first and second frame sections extending from opposite ends of said body supporting section, each of said frame sections comprising a pair of lateral arms secured at one end thereof to said body section, a crossbar joining the other end of said lateral arms of each of said frame sections, said crossbar of said first frame lying in a first horizontal plane parallel to said body supporting section, the crossbar of said second frame lying in a second horizontal plane parallel to said body supporting section, said second horizontal plane being closer to said body supporting section than said first horizontal plane, wheel means rotatably mounted on each crossbar of each of said frame sections, said wheel means comprising a pair of opposed wheels on the crossbar of said first frame and a pair of opposed wheels on the crossbar of said second frame, cog means extending from the periphery of each of said wheel means for drivingly engaging water or a planar surface which said wheel means may engage, first and second pedal means mounted substantially at the ends of said body supporting section in the area where said first and second frame sections extend from said body supporting section, said first pedal means aligned with said crossbar of said first frame and arranged to be operated by hand, said second pedal means aligned with said crossbar of said second frame means arranged to be operated by foot, said first pedal means drivingly con-

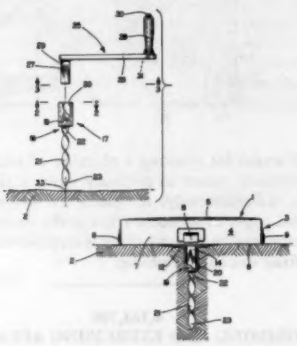
nected to said wheel means on said first frame for individually driving each of said wheels on said first frame, said second pedal means drivingly connected to said wheel means on said second frame for individually driving each of said wheels on said second frame so that greater or lesser exercising forces may be applied independently to each of said wheels by said first pedal means and said second pedal means.

4,162,789

BASEBALL BASE AND INSTALLATION APPARATUS

William D. Hollaway, 2000 - 34th St. NW., Canton, Ohio 44709

Filed Nov. 16, 1977, Ser. No. 852,090
Int. Cl.[2] A63B 71/00
U.S. Cl. 273—25 4 Claims



1. A kit for laying out a baseball field and for removably installing the bases therefor including:

(a) three bases, each of said bases having a bottom surface;

(b) post means adapted to be mounted on the base and extend vertically downwardly from the bottom surface;

(c) anchor means adapted to be removably installed in the ground, said anchor means including a top socket member having a hollow interior complementary to the configuration of the post means and a screw auger firmly secured to the bottom of the socket member and extending vertically downwardly from said socket member;

(d) brace means having a lug with a configuration complementary to the interior of the socket member and a handle for rotating the lug, said lug being adapted to be telescopically inserted into the interior of the socket member to removably install the anchor means in the ground by rotatably advancing the screw auger into the ground upon rotation of the brace means handle until the top of the socket member is flush with the top of the ground;

(e) the post means being adapted to be telescopically inserted into the socket member to secure the base in a fixed predetermined position on a baseball field after removal of the brace means lug; and

(f) flexible measuring means for determining the position of the bases on a baseball field.

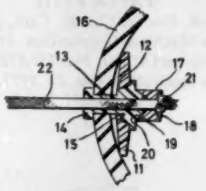
4,162,790

CONNECTOR ASSEMBLY FOR A BALL AND CORD

David R. Kelsey, Barnet, England, assignor to D. R. K. Limited, Barnet, England

Filed Feb. 21, 1978, Ser. No. 879,376
Claims priority, application United Kingdom, Mar. 18, 1977, 11570/77
Int. Cl.[2] A63B 67/10, 43/00
U.S. Cl. 273—58 C 10 Claims

1. A connector assembly means connecting a cord to a hollow ball having an aperture in the wall thereof for retainably receiving an end of the cord comprising a tubular member extending through the aperture in the wall of the ball, said member having flanges adjacent the ends thereof and a bore for passage of the cord therethrough into the interior of the ball, one of said flanges being positioned outside the ball and the other of said flanges being positioned inside the ball, and a flexible washer having an aperture and mounted on said tubular member and being positioned entirely within the ball between the interior wall of the ball and the internal flange, said washer being free from direct contact with the cord extending through the bore of said tubular member, said washer being in



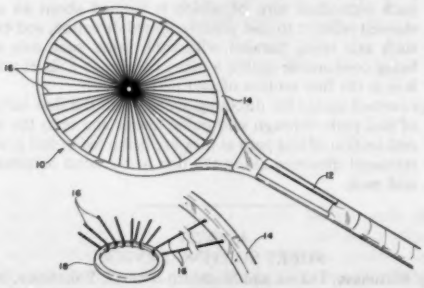
cooperative surface engagement with said internal flange and, when no external forces are exerted on the ball or cord, being spaced from the interior wall of said ball near the aperture of the ball thereby engaging the interior wall of the ball only remotely of the apertures of both the washer and ball to provide a spaced relationship between the washer and the interior wall of the ball at the aperture such that, in use, tension or shock loading applied to the cord will cause the washer to flex toward and against the interior wall of the ball.

4,162,791

TENNIS RACQUET HAVING RADIALLY ARRAYED STRINGS

Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789

Filed Oct. 20, 1977, Ser. No. 844,026
Int. Cl.[2] A63B 51/00
U.S. Cl. 273—73 D 11 Claims



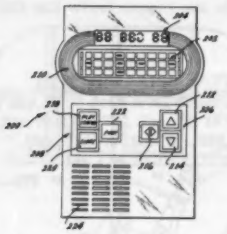
1. A racquet comprising a head of generally oval shape, said head being strung with a plurality of tensioned strings extending radially inwardly from a frame forming a closed loop, and a central ring of small size disposed approximately in the center of the string array, with at least some of the radially arrayed strings extending through and around said central ring, said central ring being smaller than the ball to be used with said racquet, and together with said string array forming an effective, substantially planar striking surface.

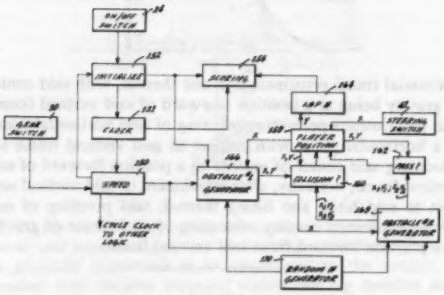
4,162,792

OBSTACLE GAME

Richard S. Chang, Rolling Hills Estates, and George J. Klose, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 12, 1977, Ser. No. 758,605
Int. Cl.[2] A63F 9/00, 9/14
U.S. Cl. 273—85 G 8 Claims





1. An electronic game comprising:

a display having segments operable within a playing field of at least three lanes and at least six rungs per lane, each of said segments being illuminatable for displaying indicia representative of the location of a player's piece and also that of obstacles;

means for moving the player's piece indicium from one lane of the field to another lane of the field in response to a manual input;

means internal to the game for automatically advancing the obstacle indicia on the playing field towards the player's piece indicium;

means for providing a predetermined algorithm; and

means for automatically determining whether or not the player's piece indicium and an obstacle indicia have collided, and, if a collision has occurred, for then automatically moving said player's piece indicium back one rung in response to the collision in accordance with said predetermined algorithm.

4,162,793

GAME SCORING SYSTEM

Gary J. Cummings, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 27, 1978, Ser. No. 890,143
Int. Cl.[2] A63D 3/02
U.S. Cl. 273—121 A 13 Claims

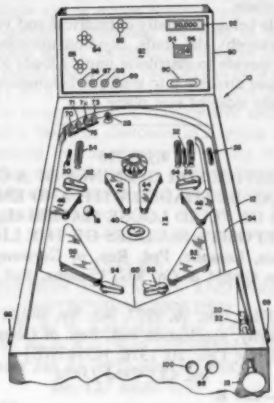
1. In a game apparatus for a plurality of players wherein each player takes a given number of turns per game for scoring points by actuating any one or more of a number of targets in response to an at least partially player-controlled object device, said game comprising:

player operable means for selecting a scoring mode for that turn;

a predetermined plurality of target means;

means for detecting the actuation of each of said predetermined plurality of target means;

a first register means for accumulating the score of the player for that game;



a second register means for accumulating the score of the player for that turn;

means for sensing completion of that player's turn; and

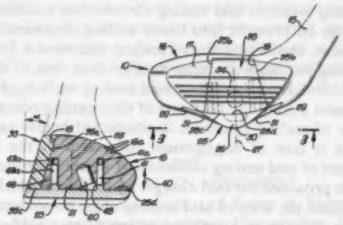
means responsive to said sensing means, said detecting means and selection of said player operable means for altering the contents of said first register means by the contents of said second register means.

4,162,794

GOLF CLUB HEAD SOLE PLATE WITH STUDS INTERLOCKING TO HEAD LAMINATIONS

Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Rey, Calif. 90271

Filed Dec. 12, 1977, Ser. No. 859,324
Int. Cl.[2] A63B 53/04
U.S. Cl. 273—174 12 Claims



1. In combination with a golf club head having multiple laminations which extend in vertically stacked relation and generally horizontally, the head having a bottom surface and a recess sunk upwardly in the head from said bottom surface, there being a head lamination extending across the upper interior of the recess, the recess being everywhere several laminations deep in vertical dimensions, the improvement comprising

(a) a metallic sole plate received upwardly into the recess,

(b) the plate having an upper side and defining multiple studs projecting upwardly from said upper side into corresponding openings extending upwardly in the head from said recess, the vertical dimensions of the studs exceeding the combined thicknesses of at least two of the laminations through which the studs project,

(c) there being adhesive bonding material bonding the studs to the walls of said openings,

(d) the sole plate having a downwardly projecting keel which extends rearwardly from the front face of the club head, the studs located at opposite sides of and being spaced from a vertical plane which extends forwardly and rearwardly, and bisects said keel, the studs being generally parallel and being of one-piece integral construction with the sole plate,

(e) the studs being generally cylindrical and vertically elongated, whereby the studs, bonding material and laminations cooperate to distribute impact loads to the keel and to the plate directly into multiple laminations at locations at opposite sides of said plane.

4,162,795

SEALING DEVICE FOR OPENINGS OF A CONTAINER WHICH CAN BE LOADED WITH AND EMPTIED OF BATCHES OF FLUID LOOSE MATERIAL, VISCOUS DEPOSITS, SLUDGES OR THE LIKE

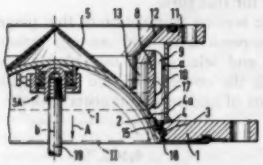
Andras Kanics, Laasphe, Fed. Rep. of Germany, assignor to Mittelmann GmbH & Co. KG, Laasphe, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,616

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1976, 7639803[U]; Dec. 20, 1976, 7639879[U]

Int. Cl.[2] F16J *15/56*

U.S. Cl. 277—237 R **43 Claims**



1. In a sealing device for an opening in the wall of a container which is loaded with or emptied of a charge of fluid loose material, viscous deposits, sludges or the like and which after the loading or the emptying is sealed tightly, said sealing device having a movably supported sealing element which can be brought into sealing abutment with a sealing seat, secured to the wall, by means of its sealing surface, the improvement comprising wherein said sealing element has a sealing surface which can be brought into linear sealing abutment with said sealing seat, above this line of sealing abutment a freely movable casing having a diameter smaller than that of the sealing abutment line is supported on said sealing surface of said sealing element during the first part of the opening operation until said line of sealing abutment is positioned below said sealing seat and is free of engagement therewith in the following movement of said sealing element and wherein a material guide device is provided for said charge, by means of which it can be guided onto the area of said sealing element enclosed by said casing resting on said sealing surface of said sealing element and on a side of said casing remote from said sealing seat to thereby protect said sealing seat from engagment with said material during the opening and closing movement of said sealing element.

4,162,796

TANK MOUNTING APPARATUS FOR TRACTORS

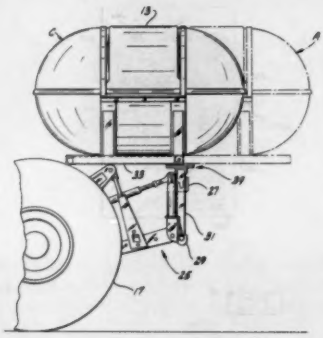
Harold C. Mead, Charles City, Iowa, assignor to Nixdorff Krein Industries, Inc., St. Louis, Mo.

Filed Mar. 2, 1978, Ser. No. 882,779

Int. Cl.[2] B60P *3/22*

U.S. Cl. 280—5 R **23 Claims**

23. Apparatus for mounting a container upon a four-wheel drive tractor having a three-point lifting hitch by means of said hitch, said hitch extending rearwardly outward from said tractor, said apparatus comprising a horizontal frame adapted to extend horizontally lengthwise under said container for supporting said container with the center of gravity of said container positioned between the ends of said horizontal frame, a vertical frame including multiple points of attachment for attachment to said hitch, pivot means securing an upper end of said vertical frame to said horizontal frame at a location on said



horizontal frame proximate one end thereof, with said center of gravity being at a position rearward of said vertical frame, said pivot means permitting pivoting of said horizontal frame in a horizontal plane with respect to said vertical frame for relocating said center of gravity to a position forward of said vertical frame, whereby, after attachment of said vertical support to said hitch and lifting thereof, said pivoting of said horizontal frames causing relocating of said center of gravity to a position forward from said vertical frame.

4,162,797

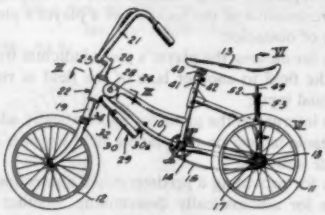
EXERCISE TRICYCLE

Thomas W. McBride, 716 E. Main St., Hoopeston, Ill. 60942

Filed Oct. 3, 1977, Ser. No. 838,751

Int. Cl.[2] B62K *5/06*; B62M *1/20*

U.S. Cl. 280—275 **12 Claims**



1. An exercise tricycle having a rigid frame, a pair of spaced rear rotary running wheels mounting the rear portion of the frame, a front rotary steering wheel mounting the front portion of the frame, a seat supported on and above the rear portion of the frame, and pedal operated driving means mounted on the frame intermediate said front and rear wheels at a suitable location below said seat and having a driving connection with said rear wheels, and comprising:

a fork attached to said front wheel and having an upwardly extending journal end portion having a stem attached to a handlebar;

bearing sleeve means within which said journal end portion is rotatable for steering maneuver of said front wheel by manipulation of said handlebar;

said frame front portion having a single forwardly extending part providing terminal projection means for attachment to said bearing sleeve means;

means pivotally connecting said bearing sleeve means on a

single horizontal axis to said terminal projection means, whereby said fork and thereby said front wheel can be shifted between a rearward position and a forwardly extended position by manipulating said handlebar for rocking said bearing sleeve and thereby said fork about said horizontal axis and correspondingly shifting the center of gravity of the tricycle;

and biasing means operating between said bearing sleeve means and said frame for normally urging said sleeve means, fork and wheel toward one of said positions.

4,162,798

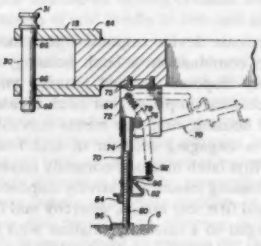
HITCHING APPARATUS

Newman C. Foley, 6705 John Ave., Superior, Wis. 54880

Division of Ser. No. 759,776, Jan. 17, 1977. This application Dec. 9, 1977, Ser. No. 859,158

Int. Cl.[2] B60D 1/14

U.S. Cl. 280—475 **5 Claims**



1. A device for supporting a tongue on a vehicle to be towed, said supporting device comprising a tubular leg member pivotally connected at its upper end to the tongue, a threaded shaft slidably mounted within said leg member and having a lower end engageable with the ground, means for releasably locking said shaft and said leg member in predetermined relative positions to adjust the height of the tongue, said locking means comprising a bracket movably mounted on said leg member and having a threaded nut section engageable with said threaded shaft, and means for urging said leg member upwardly away from the ground to a position adjacent the tongue.

4,162,799

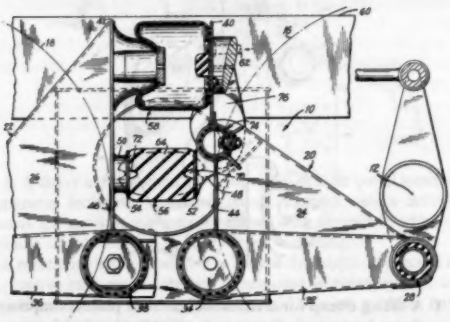
TRUCK SUSPENSION SYSTEM

Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Continuation-in-part of Ser. No. 807,002, Jun. 16, 1977, Pat. No. 4,132,432. This application Jul. 29, 1977, Ser. No. 820,369

Int. Cl.[2] B60G 5/00

U.S. Cl. 280—683 **2 Claims**



1. A multiple axle vehicle suspension structure, comprising, in combination: transversely extending axles spaced from one another longitudinally with respect to the longitudinal axis of said vehicle suspension structure, frame members spaced transversely with respect to one another and extending between said axles, opposing rocker beam assemblies separately trunnioned in said structure at an elevation beneath the elevation of said frame members, said opposing rocker beam assemblies being supported at longitudinally extending ends thereof by said axles, multiple spring means reactive with respect to said axles for operationally equalizing the load as between said axles, said multiple spring means comprising an air spring and a compressive means disposed in parallel and both intermediate and cooperative with upwardly extending faces of said opposing rocker beam assemblies, said compressive means comprising a compressive resistant elastomer as a spring member and being characterized by the absense of spring members and means other than said elastomer, said elastomeric member disposed beneath said air spring and above trunnion points of said rocker beam assemblies.

4,162,800

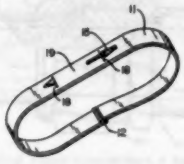
COMBINATION BOOKMARK AND WRITING INSTRUMENT HOLDER

Fred P. Gonot, Jr., 86 W. Lane Ave., Apt. 1-G, and Louis Kalliantas, 154 W. Sixth Ave., both of Columbus, Ohio 43201

Filed Jul. 11, 1977, Ser. No. 814,451

Int. Cl.[2] B42D 9/00

U.S. Cl. 281—42 **1 Claim**



1. A combination bookmark and holder for writing instruments comprising a continuous ribbon of elastic material of a sufficient length so that said ribbon will fit snugly around the average book in a direction parallel to the spline of said book, of a width greater than the diameter of the writing instrument and wherein the length of said ribbon is substantially greater than its width and which ribbon is provided with at least two, spaced, slits (writing instrument receiving-means), extending transversely across the majority of the width of said ribbon releasably to hold a writing instrument in substantial alignment with the lengthwise dimension of said ribbon, while said ribbon functions as a bookmark.

4,162,801

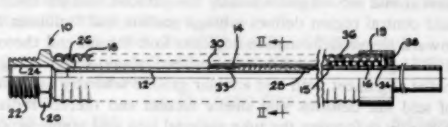
GAS LINE LEAD-IN ASSEMBLY

Fred C. Kresky; John H. Loveland, and Bryce B. Evans, all of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 16, 1977, Ser. No. 861,106

Int. Cl.[2] F16L 11/12

U.S. Cl. 285—45 **5 Claims**



1. A lead-in conduit assembly for gas lines and the like characterized by its flexibility comprising, in combination, an annu-

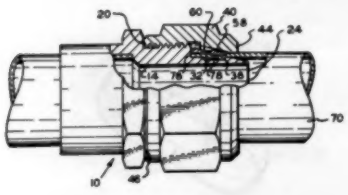
lar end fitting having attachment means defined thereon and including an annular nipple having a first end sealingly affixed to said fitting and a second free end, a flexible synthetic plastic tube coaxially sealingly mounted on said nipple free end in communication therewith, an annular socket member mounted upon said nipple free end in radial spaced relationship thereto wherein said member and nipple free end define an annular socket chamber, an end of said tube being received within said socket chamber, said socket member being radially contracted on said tube sealingly and frictionally mounting said tube upon said nipple free end, an annular plug closely circumscribing said tubing axially spaced from said nipple, and a flexible metal hose encompassing said nipple and radial spaced therefrom having a first end mounted on said fitting and a second end mounted over said plug, means attaching said hose second end to said plug, said metal hose being capable of flexible lateral deformation whereby said assembly may be readily formed into a bend without kinking of said tube.

4,162,802

PERMANENT FLARELESS TUBE CONNECTOR

Robert G. Cox, Rives Junction, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 27, 1978, Ser. No. 890,128
Int. Cl.[2] F16L *19/08*
U.S. Cl. 285—343 **4 Claims**



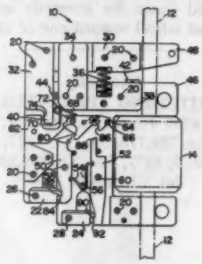
1. A flareless tube connector fitting comprising in combination, a tubular fitting body including a nipple having a free end and an outer surface for receiving a soft metal tube thereon, an annular groove defined in said outer nipple surface defining an annular shoulder surface on said nipple facing away from free end, threads defined upon said fitting body for receiving a compression nut thereon, a first radial abutment shoulder defined on said fitting body adjacent said threads facing said nipple free end, a second radial abutment shoulder defined on said fitting body adjacent said nipple and facing said nipple free end, a threaded annular compression nut adapted to be threaded upon said fitting threads, said nut having an annular inner conical cam compression surface radially positioned over said nipple surface upon said nut being fully assembled to said fitting body, and an annular radially deformable compression sleeve having first and second ends circumscribing a tube inserted on said nipple whereby said sleeve first end engages said second abutment shoulder and said sleeve second end engages said nut cam compression surface, said sleeve being formed of a soft metal and including a central region intermediate said ends thereof, the radial wall thickness of said sleeve at said central region being less than the sleeve radial wall thickness at said second end whereby the reduced wall thickness at said central region defines a hinge portion and facilitates the inward sleeve deformation adjacent said second end thereof, said hinge portion and said second end of said sleeve being in radial alignment with said annular groove whereby tightening of said nut deforms said sleeve second end thereof radially inwardly deforming the tube material into said nipple groove and into engagement with said nipple annular shoulder surface, said nut abutting said first radial abutment shoulder upon complete assembly of said fitting body and nut.

4,162,803

LATCH RELEASE DEVICE

J. Kenneth Rolfes, 216½ 13th Ave., NE. St., Petersburg, Fla. 33701

Filed Dec. 9, 1977, Ser. No. 859,231
Int. Cl.[2] B66C *1/38*
U.S. Cl. 294—83 R **14 Claims**



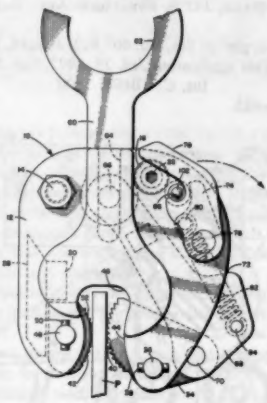
1. A latch release device responsive to a mechanical force comprising, in combination: a latch housing; operating arm means movably disposed on said housing and disposed to receive a mechanical impulse; first latch means pivotally attached to said housing; first sear means movably disposed on said housing in engaging relation to said first latch means whereby said first latch means is normally retained in a closed position; sear biasing means operatively disposed between said housing and said first sear means, whereby said first sear means is normally urged to a retaining relation with said first latch means; and trigger bar means disposed in movable interconnecting relation between said operating arm means and said first sear means whereby a mechanical force directed to said operating arm means will be transmitted to said first sear means to overcome said sear biasing means and open said first latch means.

4,162,804

LIFTING CLAMP

William Davies, Jacksonville, Fla., assignor to J. C. Renfroe and Sons, Inc., Jacksonville, Fla.

Filed Feb. 8, 1978, Ser. No. 876,006
Int. Cl.[2] B66C *1/48*
U.S. Cl. 294—101 **20 Claims**



1. A lifting clamp for articles such as steel plates comprising: a clamp body including a pair of spaced side plates, said body defining a slot through said side plates to receive an

article to be lifted, said slot being laterally enlarged inwardly of its open outer end,

a pair of opposed jaws mounted on pivot pins connected to said body on opposite sides of said slot adjacent said open end of said slot with said jaws having convex gripping surfaces facing inwardly from the opposite sides of said slot, each of said pivot pins being perpendicular to said side plates, one of said jaws being a gripping jaw pivotally mounted for opening and closing movement relative to the other jaw and the other jaw being a cam jaw,

a shackle mounted for guided movement in said clamp body and adapted for connection to a lifting force,

link means connecting said shackle to said gripping jaw to close said gripping jaw when a lifting force is applied to said shackle, said link means and said gripping jaw forming an assembly,

locking means having a manually operated handle pivotally mounted outside of said clamp body and a spring between said side plates connected to said assembly, said spring being tensioned by rotation of said handle to urge said gripping jaw toward its closing position and released by reverse rotation of said handle to free said gripping jaw to move to its open position,

said cam jaw being unconnected to said shackle and mounted for free pivotal movement about its pivot pin with its convex gripping surface extending eccentrically above its pivot pin to be cammed inwardly in the slot into closer gripping relation with said gripping jaw in response to a downward load on said convex gripping surfaces, and

said clamp body extending laterally outwardly from said slot past said cam jaw to completely enclose the outer surface of said cam jaw opposite its gripping surface and said clamp body being relieved to enlarge the side of said slot above the pivot pin for said cam jaw so that the upper end of a plate engaged between said jaws can pivot around said cam jaw while maintaining gripping contact with the convex gripping surface of said cam jaw and without engaging said side of the slot.

4,162,805

DRIVE ARRANGEMENT FOR A MOVABLE VEHICLE PANEL

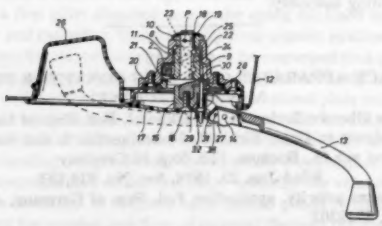
August Hirschberger, Munich, Fed. Rep. of Germany, assignor to Webasto-Werke W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,621

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657850

Int. Cl.[2] B60J 7/02

U.S. Cl. 296—137 G **14 Claims**



1. A drive arrangement for a movable vehicle panel member apparatus including a vehicle panel member and a driving means for moving said panel member with respect to adjacent vehicle structure, said driving means including:

a rotatable driving member which is drivingly connected to move said panel member in response to rotational movements of said driving member, said driving member having a first stop means,

a rotatable shaft,

a crank member drivingly connected to said shaft for applying rotational movement to said shaft,

and transmission means carried by said shaft, said transmission means forming a second stop means engageable with said first stop means to rotate said driving member along with said transmission means, said first and second stop means being arranged so that said transmission means can be freely rotated from a first position with the second stop means engaging one end travel limit of said first stop means to a second position with the second stop means engaging an opposite end travel limit of said first stop means,

said transmission means being formed by a freely traveling device disposed between said shaft and said rotatable driving member in a pair of grooves formed in surfaces thereof so as to enable said crank to move through substantially 360° without moving said panel.

4,162,806

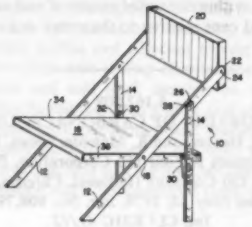
SAFETY FOLDING CHAIR

Yush-Chye Cho, 2320 Glenmore Ter., Rockville, Md. 20850

Filed Dec. 16, 1977, Ser. No. 861,122

Int. Cl.[2] A47C 4/00

U.S. Cl. 297—19 **5 Claims**



1. A safety folding chair comprises a seat portion having a pair of opposed marginal side walls, a pair of front leg portions pivotably secured to said side walls, a pair of rear leg portions pivotably secured to said front leg portions adjacent the uppermost ends thereof, a pair of plates, said pair of plates secured to said rear leg portions intermediate said walls and said rear leg portions, said pair of plates having an elongated slot therein, the uppermost region of said elongated slot having a hook-like down turned shape, a pair of pins, one end of said pair of pins fixedly secured to said side walls, the other end of said pair of pins disposed passing through said slots, means to selectively position said seat portion relative to a plane defined by the lowermost regions of said front leg portions and said rear leg portions when said lowermost regions are disposed in spaced apart relationship from one another, said means to selectively position including a pair of fasteners and a plurality of holes being located in said pair of plates, said plurality of holes being disposed in spaced apart relationship, said plurality of holes extending along the length of said rear leg portions, said pair of fasteners passing through a pair of said plurality of holes and removably secured to each of said pair of rear leg portions.

4,162,807

LUMBAR SUPPORT REGULATING APPARATUS

Noboru Yoshimura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 31, 1977, Ser. No. 847,465

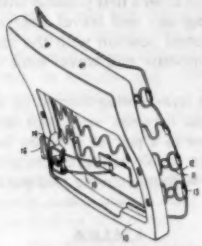
Claims priority, application Japan, Nov. 1, 1976, 51-131381; Nov. 22, 1976, 51-140580

Int. Cl.[2] A47C 7/46

U.S. Cl. 297—284 **5 Claims**

1. A lumbar support regulating apparatus disposed within a seat back comprising a rigid seat back frame, spring means secured to said seat back frame, a torsion spring, pivot means

on said frame pivotally supporting said torsion spring and disposed parallel to said seat back frame, a lumbar support plate connected to one end of said torsion spring and disposed between said spring means and said torsion spring to distribute the force of said torsion spring to said spring means, cam means rotatably mounted on said frame on an axis parallel to said seat



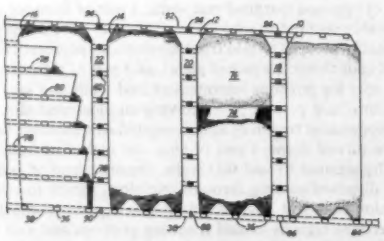
back frame and including a cam having a plurality of radially disposed cam faces thereon engageable with the other end of said torsion spring, said pivot means being disposed orthogonal to the axis of rotation of said cam and positioned axially of said cam so as to be within the radial extent of said cam and means for locating said cam relative to the other end of said torsion spring.

4,162,808

IN-SITU RETORTING OF CARBONACEOUS DEPOSITS

Rudolph Kvapil, Denver, and K. Malcolm Clews, Littleton, both of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa. and Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1978, Ser. No. 908,798
Int. Cl.[2] E21C *41/12*
U.S. Cl. 299—2 **13 Claims**



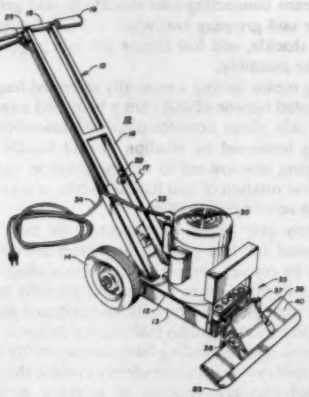
1. A method of producing fluid fuels by combustion of combustible material in carbonaceous deposits in in-situ retorts comprising successively constructing in a subsurface carbonaceous deposit in-situ retorts in a row by the sequence of stoping the retorts for rubblization and rubblizing the carbonaceous material in the retorts, each of the retorts having an inlet and an outlet spaced from the inlet, successively igniting the carbonaceous deposit in each of the retorts in series beginning at the retort at one end of the row and finishing at the retort at the opposite end of the row, injecting combustion air into the inlet of a first retort in which the carbonaceous deposit has been ignited to cause a combustion front to move through the retorts toward the outlet and release a fluid fuel from the carbonaceous deposit therein, delivering the fluid fuel from the outlet of the retort in which combustion is proceeding to the surface, maintaining at least a second retort fully rubblized between the retort in which combustion is proceeding and retorts in which stoping or rubblization is proceeding, injecting combustion air into the second retort and blocking flow therefrom to maintain the entire second retort at substantially the inlet pressure of the combustion air to prevent flow of combustion products from the first retort to the second retort.

4,162,809

OSCILLATING CARPET AND TILE STRIPPER

Lloyd E. Anderson, 6408 74th Ave. N. Brooklyn Park, Minn. 55429, and Gilbert L. Alinder, 17029 Fiesta Ct., Sun City, Ariz. 85351

Filed Feb. 6, 1978, Ser. No. 875,226
Int. Cl.[2] A47L *11/12*
U.S. Cl. 299—37 **14 Claims**



1. A carpet and tile stripping machine comprising: a support frame; motor means mounted on said frame; said motor means including eccentric means driven by said motor means to produce orbital motion in a substantially horizontal plane; handle means connected to the rear portion of said frame for guiding and maneuvering said carpet stripping machine; a cutting blade mounting assembly positioned on said frame for orbital movement in a substantially horizontal plane, said assembly having an elongated drive bar portion and a transversely extending cutting blade mounting portion; said elongated drive bar portion being operatively connected to said eccentric means with said cutting blade mounting portion being positioned beyond the front of said frame whereby the cutting blade portion is driven in an orbital, substantially horizontal path by said eccentric means; and means connected to the drive bar portion at the front end of the frame for restricting the movement of said bar portion at the front end of the frame to reduce the effect of centrifugal force on said blade mounting assembly.

4,162,810

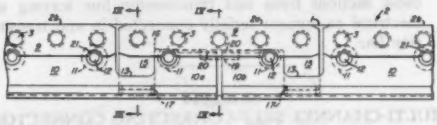
RACK APPARATUS ON A FACE CONVEYOR FOR A MINING MACHINE

Klaus Oberste-Beulmann, Sprockhovel, Fed. Rep. of Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengieserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,853
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729302
Int. Cl.[2] E21C *29/02*
U.S. Cl. 299—43 **10 Claims**

1. In combination, a face conveyor including conveyor tray sections, a drum-cutter mining machine including drive gear means to propel the mining machine along the face conveyor relative to a mine face, and a rack apparatus for guiding and advancing said drum-cutter mining machine along the mine face, said rack apparatus including a plurality of rack members each having rack gear teeth at spaced-apart intervals to mesh with said drive gear means, said plurality of rack members

including movable rack segments each bridging a joint between said conveyor tray sections, said plurality of rack members further including non-bridging rack segments each supported by an individual one of said conveyor track sections,



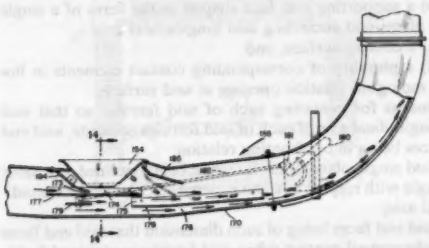
the non-bridging rack segments each having extended end members forming interlocking surfaces with surfaces on a movable rack segment to limit slidability thereof in the longitudinal direction of said face conveyor relative to the non-bridging rack segments.

4,162,811

PNEUMATIC CONVEYOR

Oliver K. Hobbs, P.O. Box 1306, Suffolk, Va. 23434

Filed Sep. 13, 1973, Ser. No. 396,807
Int. Cl.[2] B65G *53/06, 53/58*
U.S. Cl. 406—94 **3 Claims**



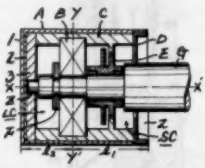
1. A pneumatic conveyor comprising a hollow conduit having a discharge end, means for introducing air into the conduit, means through one wall of the conduit for introducing material to be conveyed into the conduit downstream of the said means for introducing air and upstream of the said discharge end, a conduit wall opposite said material introducing means, a first plate disposed across the space enclosed by the conduit and extending longitudinally from a point upstream of the means for introducing material to be conveyed to a point downstream thereof, said first plate being immediately opposite the said material introducing means, a second plate extending transversely across the conduit and spaced between the first plate and the said opposite wall of the conduit, said second plate extending longitudinally downstream from adjacent to the downstream end of the first plate whereby the velocity of the air is increased at longitudinally spaced points to form air jets along the conduit and flow of material through the conduit is thereby accelerated and a check-valve provided in the conduit downstream of the upstream end of the first plate and upstream of the downstream end of the second plate, said check-valve comprising a plate pivotably fixed adjacent to the top of the conduit and adapted to swing with downstream flow of air through the conduit into an open position and to move towards a closed position upon obstruction of air flow and an increase in back pressure downstream thereof until said obstruction is removed.

4,162,812

ROTARY BEARING ASSEMBLY

Toshiyasu Takata, Onomichi; Akira Takata, Ibaraki, and Shinsuke Tsukumo, Ikeda, all of Japan, assignors to NTN Toyo Bearing Company, Ltd., Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 862,041
Int. Cl.[2] F16C *19/12, 33/72*
U.S. Cl. 308—172 **9 Claims**



1. A rotary bearing assembly comprising a cylindrical cell member having a bottom and an opposed open end, a shaft member having a groove and an end adapted to engage with the bottom of said cylindrical cell member to support thrusts applied from the outside of said cell member, a ring received in said groove for supporting thrust loads applied from the inside of said cell member, a bearing member fitted between said shaft member and said cylindrical cell member, a two-piece split sleeve positioned within and adjacent to said cylindrical cell member, a two-piece split sealing element positioned between said split sleeve and said shaft member on the side of said bearing member facing the open end of said cell member, and an annular slipping-off prevention and sealing member positioned about said shaft member at the open end of said cell member, and wherein said bearing member divides the interior of said cell member into a lubricating oil reservoir and a sealing chamber

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4,162,813

BEARING ASSEMBLY AND THE LIKE FOR USE IN CORROSIVE AND NON-CORROSIVE ATMOSPHERES

Douglas N. Mashburn, Knoxville; Harold C. Woodall, Kingston, and Ralph R. Wright, Oak Ridge, all of Tenn., assignors to The United States of America as repesented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 666,533
Int. Cl.[2] F16C *33/24*
U.S. Cl. 308—237 R **10 Claims**

8. A machine element comprising first and second members having relatively movable mutually contacting surface portions, each of said portions having a hardness exceeding about 500 HV_{100} on the Vickers hardness scale, one of said surface portions being alumina and the other chemically deposited nickel, said surface portions having a coating of a lubricant which is stable in halogen-containing atmospheres.

4,162,814

LIGHTED DISPLAY CHAMBER

James J. Garbero, 1114 McClaren Dr., Carmichael, Calif. 95608, and Ronald F. Cook, 8 NW. Eighth St., Pendleton, Oreg. 97801.

Filed Jul. 17, 1978, Ser. No. 924,913
Int. Cl.[2] A47B *77/00*
U.S. Cl. 312—223 **15 Claims**

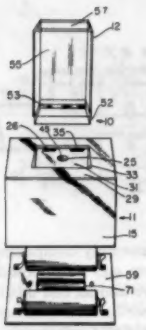
1. A lighted display chamber for articles comprising a bottom section and a transparent top section, said top section being adapted to close a switch to switch on illumination source in said bottom section upon predetermined oriented contact of said top section with said bottom section,

said top section including at least one upstanding side wall having an electrical contact at the bottom edge thereof,

said bottom section being configured boxlike and comprising

a floor having a bore therethrough for the transmission of light, and at least one upstanding side wall, secured normal to said floor and extending downwardly therefrom, thereby defining a space for the disposition of an illumination source,

an illumination source disposed in said space and adapted to transact light through said floor's bore,



means disposed in said bottom section adapted to cooperate with the electrical contact of said top section to switch on said illumination source when said top section is placed in contact with said bottom section in a predetermined orientation.

4,162,815

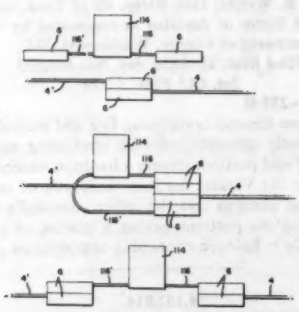
MEANS FOR CABLE SECTION AND EQUIPMENT TRANSFER WITHOUT SERVICE INTERRUPTION

James E. Fleischhacker, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 783,127, Mar. 31, 1977, which is a continuation-in-part of Ser. No. 630,589, Nov. 10, 1975, abandoned. This application Jan. 11, 1978, Ser. No. 868,597

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—19 **4 Claims**



1. A method for incorporating electrical equipment into a multiconductor transmission line cable having cable sections serially connected by stackable electrical connectors having wire-receiving electrical terminals which become interconnected when said connectors are stacked one on the other, the steps comprising:

connecting one of said stackable electrical connectors to an input cable of said electrical equipment,

connecting a second of said stackable electrical connectors to an output cable of said electrical equipment,

stacking said one of said stackable electrical connectors to a first pair of stackable connectors which serially connect one of said cable sections in said transmission line,

stacking said second stackable electrical connectors to a second pair of stackable connectors which serially connect said one of said cable sections in said transmission line, thereby connecting said electrical equipment electrically in parallel with said one of said cable sections, and

disconnecting the electrical connectors of said one of said cable sections from said transmission line leaving said electrical equipment serially connected in said transmission line.

4,162,816

MULTI-CHANNEL SELF-CORRECTING CONNECTOR

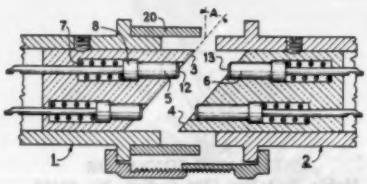
Christian Malsot, Suresnes, France, assignor to Socapex, Suresnes, France

Filed Dec. 27, 1977, Ser. No. 864,704

Claims priority, application France, Dec. 31, 1976, 76 39719

Int. Cl.[2] H01R *9/04*

U.S. Cl. 339—64 M **26 Claims**



1. A multichannel connector comprising

(1) a pair of cylindrical ferrules, each having

(a) a longitudinal axis,

(b) a supporting end face shaped in the form of a single plane, and encircling said longitudinal axis,

(c) a contact surface, and

(d) a plurality of corresponding contact elements in homologous relation opening at said surface;

(2) means for centering each of said ferrules so that said longitudinal axis of each of said ferrules coincide, said end faces being in confronting relation;

(3) said single plane of each ferrule being inclined at a same angle with respect to a plane, perpendicular said longitudinal axis;

(4) said end faces being of such dimension that said end faces make mutual contact when said ferrules are moved longitudinally toward each other; and

(5) said contact between end faces when said ferrules are axially urged together causing a rotational coupling of faces to mate said end faces and said corresponding contact elements.

4,162,817

ELECTRICAL CONNECTOR

Barry D. Briggs, New Concord, and Ray L. Lawter, Zanesville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 30, 1978, Ser. No. 892,046

Int. Cl.[2] H01R *13/20*

U.S. Cl. 339—75 MP **8 Claims**

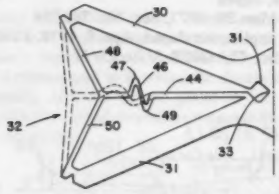
1. A connector for coupling together the conductors of a plurality of electrical components comprising;

an elongated one piece body formed of a flexible electrical insulating material having a pair of jaw portions for clamping together the conductors of said components located therebetween;

a pair of spaced-apart lever portions each connected to one of said jaw portions and extending outwardly therefrom, each lever portion joined together adjacent said jaw portions forming a fulcrum portion for affecting the movement of its associated jaw portion upon the movement of the lever portions;

a first flexible portion interconnecting the ends of the lever portions;

and a second flexible portion secured to the first flexible portion intermediate its ends and the one piece body adjacent the fulcrum portion, said first and second flexible



portions being moved to a deformed position upon the inward movement of said lever portions for constantly urging the lever portions to a position in which the jaw portions provide a clamping pressure on said conductors.

4,162,818

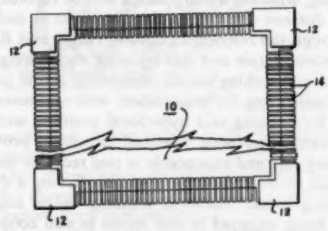
INTERCONNECTION FOR PLANAR ELECTRONIC CIRCUITS

Jacob H. Martin, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,268

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—112 R **6 Claims**



1. A multiple circuit board packaging system for electronic devices comprising:

at least one planar electronic circuit board, having a plurality of connecting leads radiating outwardly to the edge of the board on one side;

a planar circuit board support means having high heat transfer qualities affixed to one side of the circuit board forming a package;

protective means covering the circuit board on the side away from the support means;

circuit board interconnecting means comprising at least two wall like members, each having a plurality of sequentially positioned angulated slots on one side for receiving a circuit board package and means for resiliently securing a circuit board in the slot while simultaneously making electrical contact with circuit connecting leads.

4,162,819

ELECTRICAL TERMINAL

Klaus Eisert, Blomberg, Fed. Rep. of Germany, assignor to Phönix Elektrizitätsgesellschaft H. Knümann & Co., Blomberg, Fed. Rep. of Germany

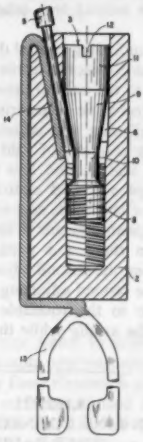
Filed Mar. 23, 1978, Ser. No. 889,434

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713494

Int. Cl.[2] H01R *9/10*

U.S. Cl. 339—247 **10 Claims**

3. An electric terminal device comprising a body formed with a screw passage and with a wire passage converging toward and merging with said screw passage, said body having a face at which both said passages open close to one another, said wire passage being adapted to receive an electric conductor, and a screw threadedly received in said body and disposed in said screw passage for clamping said wire in said body, said screw having a cylindrical thread-free guide portion accessible



to enable rotation of said screw, a conical thread-free clamping portion intermediate said guide portion and the opposite end of said screw, and a threaded portion at said opposite end of said screw, said conical portion converging toward said threaded portion and said passages including an acute angle between them.

4,162,820

BINOCULAR TELESCOPE

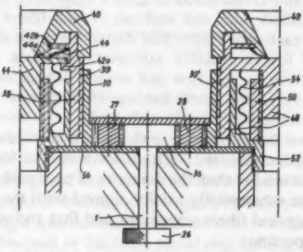
Kurt Schwab, Innsbruck, and Richard Koholka, Fritzens, both of Austria, assignors to D. Swarovski & Co., Wattens, Austria

Filed Nov. 29, 1977, Ser. No. 855,760

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654325

Int. Cl.[2] G02B *7/06*

U.S. Cl. 350—36 **5 Claims**



1. In a binocular telescope having a pair of eye-pieces set in threaded mounts wherein a mutual drive simultanously focuses both eyepieces and frictional clutch means connects the eye-pieces to one another so that the clutch means slips when one eyepiece is held stationary while the other eyepiece is turned so as to selectively render the eye-pieces independently adjustable, wherein the improvement is characterized by:

the first eye-piece including a first lens tube and first adjusting tube which are rigidly connected to one another and

are both restricted to axial movement with respect to the binocular telescope;

the second eye-piece including a second lens tube, and means for restraining the lens tube to axial movement only, and a second adjusting tube, coaxially disposed with relation to the second lens tube, wherein the second adjusting tube is both axially and rotatably adjustable and is coupled to the second lens tube by the friction clutch means; and

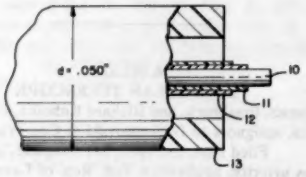
the mutual drive including central drive means that operates rotatable means connected to the adjusting tubes of both eyepieces and to the central drive means, whereby rotation of the central drive means rotates said rotatable means for axially displacing said adjusting tubes and said lens tubes; wherein rotation of said second adjusting tube axially moves said second lens tube and, through said rotatable means and said central drive means, axially moves said first lens tube, as long as said clutch couples said second adjusting means to said second lens tube; and wherein, when there is a predetermined resistance to rotation between the second adjusting tube and the rotatable means, the second adjusting tube rotates and moves axially relative to the rotatable means to displace the second lens tube axially while the first lens tube remains stationary.

4,162,821

MEANS FOR IN-LINE CONNECTION OF OPTICAL FIBER PAIRS

William L. Schumacher, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1977, Ser. No. 862,478
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **8 Claims**



5. A connector for connecting together ends of at least one pair of optical fibers, said connector comprising:

first and second connector portions each having a datum surface and constructed to grip a respective one of said optical fibers with end sections of said fibers extending toward each other from said datum surfaces; and

third and fourth matable connector portions connected respectively to said first and second connector portions, respectively, and each having at least one opensided groove formed in a surface thereof;

said grooves being matable with each other when said third and fourth connector portions are mated to form at least one bore smaller than the diameter of each said cores with said bore substantially axially aligned with the remainder of said optical fibers gripped in said first and second connector portions;

said end sections of said at least one pair of optical fibers being retained in said at least one of said bores between said third and fourth connector portions with end surfaces of said optical fibers in substantial concentric relationship with each other and spaced apart a distance not more than one and one-half the diameter of each said end sections;

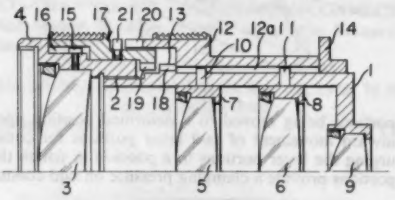
said third and fourth connector portions further each being substantially comprised of an elastomeric material with the grooved portions thereof which contact said end sections having an index of refraction less than the index of refraction of the outer surfaces of said end sections.

4,162,822

ZOOM LENS ASSEMBLY WITH RESTRICTABLE ZOOMING RANGE

Masahiko Nonogaki, Kōnan, Japan, assignor to Elmo Company Limited, Nagoya, Japan

Filed Mar. 30, 1977, Ser. No. 782,784
Claims priority, application Japan, Apr. 9, 1976, 51-45012[U]
Int. Cl.[2] G02B 7/10, 15/18
U.S. Cl. 350—187 **1 Claim**



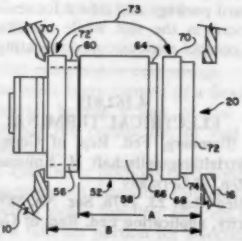
1. In a zoom lens assembly for a photographic camera including a focussing ring, a zooming ring and a stationary fixed tube for supporting said rings and associated lens, the improvement comprising means for making operation of the lens assembly free from the necessity of focussing for certain conditions of the lens assembly, said improvement comprising locking means for fixing said focussing ring at a hyperfocal position on said fixed tube and means cooperating with said locking means for restricting the rotation and hence the zooming range of said zooming ring, whereby a sharp image will be recorded at said hyperfocal distance of said focussing ring as set by said locking means, through the restricted zooming range, said fixed tube having a recess therein and said zooming ring having a recess therein, and said locking means comprising a first projection on said focussing ring for engagement with said recess in said fixed tube for defining said hyperfocal position, and said restricting means comprising a second projection provided on said focussing ring and engageable in said recess in said zooming ring, said recess in said zooming ring having a dimension corresponding to the restricted zooming range, said second projection being engaged in said recess in said zooming ring when said first projection engages in said recess in said fixed tube.

4,162,823

LENS MOUNT FOR PHOTOGRAPHIC RECORDING APPARATUS

Brian K. Jorgensen, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 31, 1977, Ser. No. 847,373
Int. Cl.[2] G02B 7/04
U.S. Cl. 350—252 **1 Claim**



1. A lens structure for use in a photographic recording apparatus including an image plane, an object plane, and film, the lens structure comprising:

a tubular cylindrical mounting sleeve having a first mounting shoulder on one end thereof and a second mounting shoulder on the other end thereof;

a lens assembly removably attached to said mounting sleeve; and

a tubular cylindrical spacer interchangeably mounted on said first or said second mounting shoulder to increase the distance between said lens assembly and the film in the first instance and to increase the distance between the lens assembly and the object plane in the second instance, thereby providing two different magnification ratios without refocusing.

4,162,824

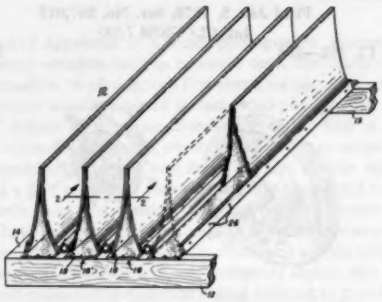
NONIMAGING RADIANT ENERGY COLLECTOR AND CONCENTRATOR

Horace Z. Ma, 1420 Farwood Dr., East Lansing, Mich. 48823

Filed Jun. 30, 1978, Ser. No. 920,786

Int. Cl.[2] G02B 5/10

U.S. Cl. 350—293 **19 Claims**



1. A nonimaging radiant energy collector comprising:

a base member;

a plurality of resiliently deformable, planar vanes having parallel upper and lower end portions, a back surface and a reflective front surface; and

means for attaching said vanes to said base member in pairs, each pair including two vanes having facing back surfaces and separated lower end portions, the lower end portions being inclined towards one another to make the same preselected angle with a plane of symmetry and the upper and lower end portions of each vane being separated so that the upper end portions of a pair of vanes are urged against one another and deform the planar vanes into concave vanes.

4,162,825

METHOD FOR ADJUSTING THE RADIUS OF CURVATURE OF A SPHERICAL MIRROR

James R. Dowty, Newport Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Aug. 5, 1977, Ser. No. 822,176

Int. Cl.[2] G02B 5/10

U.S. Cl. 350—295 **2 Claims**

1. A method of adjusting the radius of curvature of a spherical mirror defined by a reflective concave front surface and a convex back surface with a common surrounding edge, including the steps of:

providing a relatively fixed element having a defined circular locus of contact points at a first diameter in contact with one of said surfaces of said mirrors;

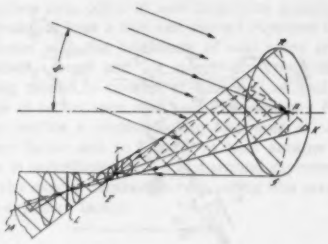
providing a forming element having a defined circular locus of contact points concentric with said fixed element contact points at a second diameter different than said first diameter in contact with the other surface of said mirror;

applying a couple to said spherical mirror through said forcing element and said fixed element to adjust the radius of curvature of said spherical mirror;

monitoring said radius adjustment and generating an electrical signal in response thereto;

generating a command signal indicative of a desired amount of mirror adjustment;

comparing said monitoring signal with said command signal to generate a difference signal;



employing said difference signal to control the amount of adjustment in said couple applying step; and

wherein said relatively fixed element is provided in contact with said concave surface and said forcing element is provided having a circular locus of contact points at a second diameter larger than said first diameter and contacting said convex surface of said mirror.

4,162,826

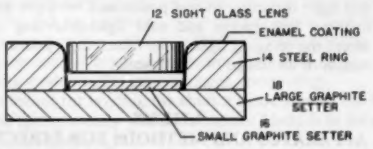
SIGHT GLASS ASSEMBLY AND METHOD FOR ITS PRODUCTION

Roland R. Van der Beck, Pittsford, and James W. Chapman, Penfield, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,076

Int. Cl.[2] C03C 27/02

U.S. Cl. 350—319 **5 Claims**



1. A sight glass assembly comprising a lens of soda-lime plate glass mounted in and compressed by an enamelled steel, Inconel or Incolloy metal ring having a wall thickness at least equal to 0.3 times the diameter of said lens, said metal ring having an enamel coating, and said lens being fused to said coating.

2. A method of making a sight glass assembly comprising:

(a) placing a non-adhesive substrate setter within a bore of a steel, Inconel or Incolloy metal ring having a wall thickness at least equal to 0.3 times the inside diameter of the ring and having an enamel coating

(b) placing a soda-lime plate glass lens in the bore of said enameled ring;

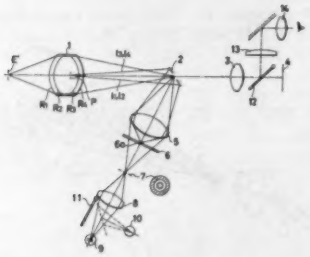
(c) heating the substrate, the metal ring and the glass lens so arranged to the flowpoint temperature of said lens so that said ring expands and said lens conforms to the bore of said ring and is fused to said enamel coating;

(d) and cooling said ring and said lens to compress said glass lens within said enameled ring.

4,162,827
WIDE ANGLE OBJECTIVE FOR OPHTHALMOSCOPIC INSTRUMENT

Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,877
Claims priority, application Japan, Jun. 9, 1976, 51/67521
Int. Cl.[2] A61B *3/14*
U.S. Cl. 351—7 **7 Claims**



1. An opthalmoscopic optical instrument having a wide angle of view of an object comprising;

objective lens means having a positive refractive power and including a triplet cemented lens consisting of a negative meniscus lens convex toward the object, a biconvex lens and a negative meniscus lens concave toward the object; said triplet cemented lens having outer lens surfaces and cemented surfaces

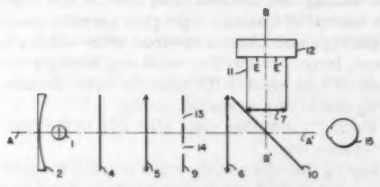
an image forming lens for re-imaging an image formed by said objective lens means; and

an illuminating system having at least one light source for illumination of the object, apertured mirror for directing the illuminating light rays toward the object, and optical means for transmitting the light rays emanating from said light source to said apertured mirror, said apertured mirror being positioned on the object end of said image forming lens group; said apertured mirror being positioned between said objective lens means and said image forming lens; masking means positioned between said light source and said apertured mirror for substantially eliminating reflection from the outer lens surfaces and cemented surfaces of said triplet cemented lens; light-detecting means positioned on the image end of said image forming lens and light directing means positioned between said image forming lens group and said light-detecting means to direct the imaging light to an observing system for observation of an image of the object.

4,162,828
APPARATUS AND METHODS FOR DIRECTLY MEASURING THE REFRACTION OF THE EYE

Joseph N. Trachtman, 57 Hicks St., New York, N.Y. 11201

Filed Sep. 30, 1977, Ser. No. 838,107
Int. Cl.[2] A61B *3/10*
U.S. Cl. 351—9 **9 Claims**



1. Optometer apparatus for directly measuring the refraction of the eye comprising:

a radiation source;

Scheiner principle means for imaging a pair of slits onto the plane of the pupil of an eye to be measured to form a retinal image, said Scheiner principle means projecting two slits of parallel light in Maxwellian view onto said plane of said pupil of said eye to be measured;

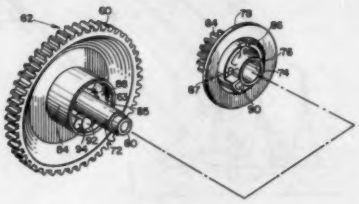
sensor array means including a plurality of sensor elements arranged in an array, each of said sensor elements producing an electrical signal having a magnitude which is a function of incident radiation received by that sensor element, said sensor array means being responsive to incident radiation to produce a plurality of electrical signals corresponding to an element-to-element energy distribution of radiation imaged upon said sensor means; and

means for imaging said retinal image upon said sensor array means.

4,162,829
PHOTOGRAPHIC FILM DRIVE SYSTEM EMPLOYING INERTIA DUMPER/ENERGY DISSIPATER

Gerald H. Cook, Lynnfield, and Bernard W. Ruck, Milford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1978, Ser. No. 867,015
Int. Cl.[2] G03B *1/00*
U.S. Cl. 352—166 **5 Claims**



1. In a mechanical transmission system for advancing an elongated web of material from a first spool, to which one of its ends is attached and around which a major portion of its length is initially coiled, onto and around a second spool, to which the other of its ends is attached, the improvement comprising:

a driving member mounted for rotation about a given axis;

means coupled to the second spool for defining a first arcuate surface spaced a fixed distance radially from said axis and extending parallel to said axis;

means coupled to said driving member for defining a second arcuate surface facing said first arcuate surface in spaced apart parallel relationship to define a channel therebetween extending circumferentially of said axis;

a pair of abutment surfaces respectively connected to said driving member and said first arcuate surface defining means to be disposed in facing relationship in circumferential registry with said channel; and

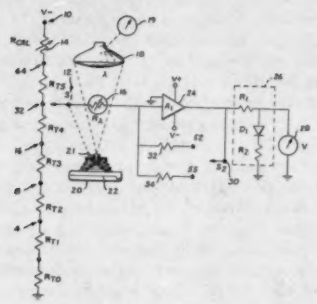
a yieldably resilient shock absorber disposed along said channel intermediate said abutment surfaces, whereby rotary motion is imparted to the second spool from said driving member through said shock absorber which is adapted to absorb shock forces by compressing when the web has been completely uncoiled from the first spool or sudden increased resistance to web advancement is otherwise experienced,

said shock absorber being structured to expand widthwise of said channel to be engaged between said first and second arcuate surfaces as it absorbs said shock forces or forces resulting from increased resistance to web advancement, whereby the dissipation of energy so absorbed therein is resisted by frictinal forces between said shock absorber and said arcuate surfaces so that said shock absorber only gradually returns to its original expanded configuration upon termination of power to said driving member.

4,162,830
VIDEO PHOTOGRAPHIC SYSTEM

Alan E. Gee, Sunnyvale, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1977, Ser. No. 785,391
Int. Cl.[2] G01D *9/42*; G03B *27/76*; G01J *1/44*
U.S. Cl. 354—23 R 5 Claims

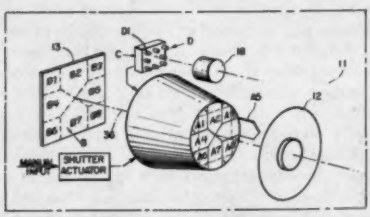


1. Control apparatus in a video-photographic system for coordinating variables such as exposure time, film reciprocity and illumination, to photograph film characteristic comprising: photodetector means disposed in said video-photography system and subject to the same illumination as the film in said system; voltmeter means for recording the voltage output of said photodetector means; non-linear voltage divider means including a first resistor in series with diode means and a second resistor, said first resistor being interposed in series between said photodetector means and said voltmeter means, and said voltmeter means and said diode means and second resistor being disposed in parallel with said voltmeter means, said first and second resistors and said diode being selected to provide a binary relationship with said voltmeter means such that about one-fourth full scale voltage on said diode means provides substantially a mid-scale reading on said voltmeter means; variable non-linear voltage divider means connected to said photodetector means, said variable non-linearity having a predetermined relationship to the reciprocity failure rate of photographic film used in said system.

4,162,831
CAMERA AND METHOD FOR SELECTIVELY COMPRESSING SCENE BRIGHTNESS

Nathan Gold, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 756,433, Jan. 3, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,960
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—31 31 Claims



1. In a camera having a lens assembly for directing image-carrying rays from a scene to a frame of film material located at the camera focal plane, said film material having a density range extending between given minimum and maximum exposure density limits, the improvement comprising:

means for sensing the brightness of each of a plurality of spacially oriented areas of said scene;

a multizone shutter arangement having a plurality of independently actuatable spacially oriented portions for independently varying the transmission of at least a significant portion of the image-carrying rays from each said scene area to a pictorially corresponding area of said film material;

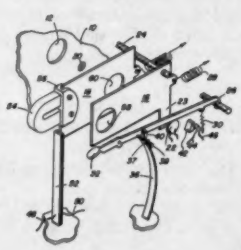
means for independently actuating each said shutter portion; and

control means responsive to said brightness sensing means for defining at least a first and second exposure factor in accordance with the brightness of said scene areas and said density range and for selectively controlling said actuating means to control at least one of said shutter portions in accordance with said first exposure factor to thereby expose a corresponding film area at said first exposure factor and to control at least another shutter portion in accordance with a said second exposure factor to thereby expose another corresponding film area at said second exposure factor.

4,162,832
EXPOSURE CONTROL WITH PIEZOELECTRIC LATCH CONTROL

Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,321
Int. Cl.[2] G03B *7/08*; H01R *39/08*
U.S. Cl. 354—51 10 Claims



1. In exposure control apparatus for use in a camera of the type having (a) an aperture, (b) a shutter blade having an aperture-open position and an aperture-closing position, and (c) spring means for urging the shutter blade toward its aperture-closing position, the improvement comprising:

magnet means for holding the shutter blade against the force of the spring means when the shutter blade is in its aperture-open position;

a piezoelectric motor element, movable upon being subjected to an electrical voltage, for pushing said shutter blade away from said magnet means, whereby said shutter blade will move to its aperture-closing position under the influence of the spring means; and

light-responsive means for applying an electrical voltage to said element after a time delay dependent on the level of scene illumination.

4,162,833
PHOTOGRAPHIC CAMERA

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 529,904, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 428,454, Dec. 26, 1973, abandoned. This application Aug. 15, 1977, Ser. No. 824,416
Int. Cl.[2] G09B *17/52*
U.S. Cl. 354—86 8 Claims

1. Photographic apparatus of the self-developing type for

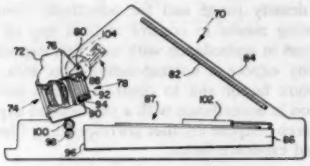
use with film units requiring an even number of geometrical reversals and with film units requiring an odd number of geometrical reversals to provide a geometrically non-reversed positive image in the film unit, comprising:

means for locating a film unit in position for exposure;

pressure-applying means including at least two juxtaposed members for spreading a processing fluid across a photosensitive layer of the film unit;

lens means for geometrically reversing an image of a subject along two orthogonal axes;

optical means including first and second means each of which geometrically reverses the image of the subject



along only one of said orthogonal axes, said optical means being mounted on the side of said lens means which is opposite to the side of said lens means which faces the subject to be photographed; and

means for moving said first means between a first position wherein it is in optical alignment with said lens means and said second means so as to receive the image being transmitted by said lens means when the film unit requires an even number of geometrical reversals and a second position out of optical alignment with said lens means and said second means when the film unit requires an odd number of geometrical reversals.

4,162,834

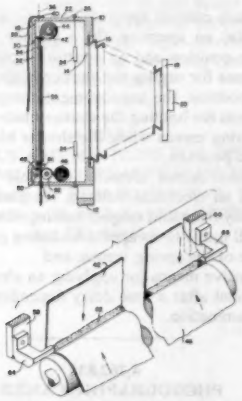
PROCESSING APPARATUS FOR LARGE FORMAT CAMERAS

Allan D. MacLean, North Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 23, 1977, Ser. No. 863,992

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **7 Claims**



1. A large format camera of the type in which a negative film sheet may be exposed and thereafter processed in conjunction with a positive film sheet to provide a positive image photographic print, said camera comprising:

a film exposure plane;

a pair of elongated processing rollers;

means for mounting said processing rollers for rotation in closely spaced apart relation with respect to each other so as to define a pressure applying gap therebetween through which the negative film sheet may be advanced from the film plane and the positive film sheet may be advanced from a stored position spaced apart from said film plane to converge with the negative film sheet along said pressure applying gap;

means for accommodating the deposition of a select quantity of processing fluid composition between the converging negative and positive film sheets at a location closely adjacent said pressure applying gap, said quantity of processing composition being selected to be sufficient to be spread over an area between the negative and positive film sheets corresponding to the entire exposed area as the film sheets are drawn through the processing rollers; and

means for retaining the spread of the processing composition inside the side edges of said negative and positive film sheets as the film sheets are advanced through said rollers, said spread retaining means comprising a pair of opposed nozzle members stationed respectively between said negative and positive film sheets adjacent opposed side edges thereof, each of said nozzle members having outside convergent surfaces complementary to the convergent film sheets and a nozzle opening between said convergent surfaces through which pressurized air may be discharged between the film sheets in a direction inwardly from the side edges of the film sheets and toward said roller gap so as to intersect the direction of film sheet advancement at an acute angle in order to retain the processing composition within the confines of the side edges of the film sheets during the spreading of the processing composition between the film sheets as the film sheets are advanced through said processing roller gap.

4,162,835

DATA PRINTING DEVICE FOR CAMERA

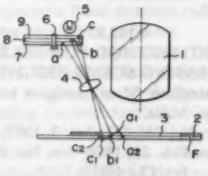
Seiji Asano, Okegawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed May 24, 1977, Ser. No. 800,060

Claims priority, application Japan, May 26, 1976, 51-67194[U]

Int. Cl.[2] G03B *17/24, 27/68*

U.S. Cl. 354—106 **3 Claims**

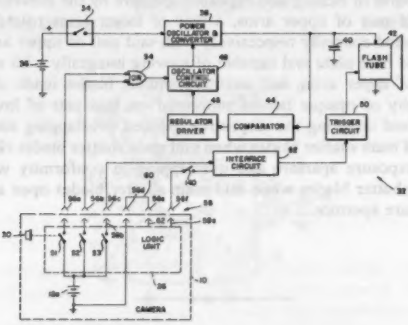


1. Data printing means built into a camera which includes a taking lens having an optical axis perpendicular to the surface of a film loaded in the camera comprising, a focusing lens in the camera having an optical axis passing through a part of the film loaded in the camera and inclined at an angle with respect to the optical axis of the taking lens, and data carrying means including a plurality of stacked data carrying plates which carry different indicia, one of the indicia on each plate being selectively put into alignment with the optical axis of said focusing lens, each of said plates having a thickness that the indicia on the different plates are at different distances from the surface of said film, characterized in that said plates are parallel to the surface of said film and said different indicia items carried by the different plates are different in size in such a way that the sizes of the images focused on the film by said focusing lens are substantially the same.

4,162,836
ELECTRONIC FLASH INHIBIT ARRANGEMENT

George C. Harrison, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 21, 1978, Ser. No. 917,477
Int. Cl.[2] G03B 3/10, 15/05
U.S. Cl. 354—139 6 Claims



1. Electronic flash apparatus for use with a camera of the type having a variable focus objective lens and having automatic focusing means with ranging means for the automatic focusing of the objective lens, electrically-energizable camera control means responsive to manual actuation for automatically operating the ranging means for driving the objective lens to a focus position with respect to a scene to be photographed, and means for providing a camera signal commencing in response to the manual actuation of the control means and not later than the automatic focusing operation, and wherein the camera focusing means is subject to detrimental interference from spurious electromagnetic radiation,

said electronic flash apparatus having

an energy-storage capacitor and a flash-discharge tube,

charging means energizable by an applied supply voltage for producing an alternating voltage and a direct voltage in response thereto, and for charging the capacitor with the direct voltage,

means responsive to a flash fire signal from the camera for discharging the capacitor through the flash tube,

and further comprising

control means responsive to said camera signal for disabling said charging means from producing said alternating voltage, so that the flash apparatus is disabled from producing spurious electromagnetic radiation, during at least the operation of the camera focusing means.

4,162,837
MOTOR DRIVE DEVICE FOR CAMERA

Keisuke Haragushi, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1977, Ser. No. 831,319
Claims priority, application Japan, Sep. 7, 1976, 51-106913
Int. Cl.[2] G03B 1/18
U.S. Cl. 354—173 6 Claims

1. A motor drive device for a camera comprising:

a motor,

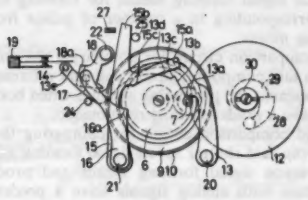
a sun gear driven by said motor,

driven means for providing an output film drive to the film winding members in a camera,

an internal gear coupled to said driven means,

a plant gear meshing with said sun gear and said internal gear, said planet gear being adapted to revolve around said sun gear, and

locking means for elastically locking said planet gear when said internal gear is free to rotate so that said planet gear is prevented from revolving around said sun gear while permitted to rotate about its own axis and acts as a relay

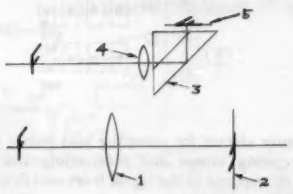


gear to transmit the drive force of said motor to said driven means.

4,162,838
CAMERA VIEWFINDER

Norman C. Allen, P.O. Box 58565, Houston, Tex. 77508

Filed Dec. 30, 1977, Ser. No. 865,955
Int. Cl.[2] G03B 13/02
U.S. Cl. 354—223 4 Claims



1. An accessory for use with a camera to aid in viewing the image being transmitted by the lens through the shutter to the film thereof, said accessory comprising an imaging lens, an Amici roof prism, and a diffuse viewing screen suitably positioned relative to each other so as to allow viewing of the image obtained by said accessory lens on said screen in a normal, facile manner, said accessory having means for mounting same on a camera in a suitable position thereon relative to the camera lens, said viewing screen being adapted to be rotated about an axis parallel to the axis of the camera lens and perpendicular to the axis of the film to enable the said accessory to be optionally used as a waist level viewer and a right angle viewer.

4,162,839
DUAL PREFERENCE CAMERA FOR DIGITALLY DISPLAYING PRESET AND COMPUTERED VALVES

Yukio Mashimo, Tokyo; Nobuaki Sakurada, Yokohama; Tadashi Ito, Yokohama; Fumio Ito, Yokohama; Nobuhiko Shinoda, and Hiroyashu Murakami, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 604,532, Aug. 14, 1975, Pat. No. 4,064,515. This application May 13, 1977, Ser. No. 796,716
Claims priority, application Japan, Aug. 30, 1974, 49-99687
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—23 D 5 Claims

1. A camera comprising:

(a) a light measuring circuit for producing an analog signal corresponding to the brightness of a photographic object.

(b) shutter speed signal forming means for producing an analog signal corresponding to a preset shutter speed value,

(c) a computing circuit for producing an analog signal corresponding to an aperture value for correct exposure on the

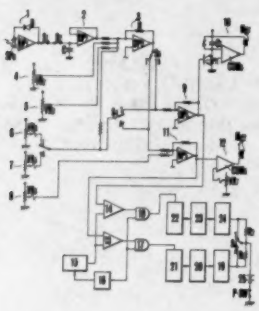
basis of said analog signals from light measuring circuit and shutter speed signal forming means,

(d) pulse generating means for producing pulses,

(e) reference signal forming means for forming an analog signal corresponding to a number of pulses from pulse generating means,

(f) a first comparison circuit for comparing the analog signals from said computing circuit and said reference signal forming means, and producing a signal when both analog signals have a predetermined relationship,

(g) a second comparison circuit for comparing the analog signals from said shutter speed signal forming means and said reference signal forming means and producing a signal when both analog signals have a predetermined relationship,



(h) first counter circuit for counting said pulses from said pulse generating means and terminating the counting operation in response to the signal from said first comparison circuit,

(i) a second counter circuit for counting said pulses from said pulse generating means and terminating the counting operation in response to the signal from said second comparison circuit,

(j) a first display circuit for displaying an aperture value for correct exposure on the basis of content of said first counter circuit,

(k) a second display circuit for displaying said preset shutter speed value on the basis of content of said second counter circuit.

4,162,840

FOCAL PLANE SHUTTER

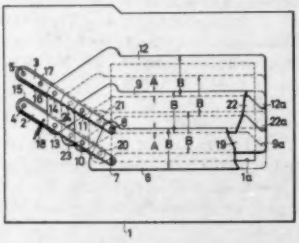
Osamu Ooba, Abiko; Katsumi Kaneko, Ageo; Nobuyoshi Inoue, Kawagoe, and Toshihisa Saito, Tokyo, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,384

Claims priority, application Japan, Mar. 24, 1977, 52-32425

Int. Cl.[2] G03B 9/40

U.S. Cl. 354—246 **3 Claims**



1. A focal plane shutter comprising a base plate having an exposure aperture formed thereon, a pair of upper arms rotatably supported on said base plate, main shutter blades made of a plurality of opaque laminae supported on said pair of upper arms to open and close said exposure aperture and increasing the area of the overlap with each other in the course of opening said exposure aperture by the movement of said pair of upper arms and reducing the area of the overlap with each other in the course of closing said exposure aperture by the movement of said pair of upper arms, a pair of lower arms rotatably supported coaxially respectively with said pair of upper arms on said base plate and capable of moving integrally with said pair of upper arms, and auxiliary shutter blades made of a plurality of opaque lamina supported on said pair of lower arms and covering the respective reduced overlapping zones of said main shutter blades when said main shutter blades close said exposure aparture and overlapping in conformity with main shutter blades when said main shutter blades open said exposure aperture.

4,162,841

APPARATUS FOR DEVELOPING FILMS, AND PARTICULARLY X-RAY FILMS AS EMPLOYED IN DENTAL APPLICATIONS

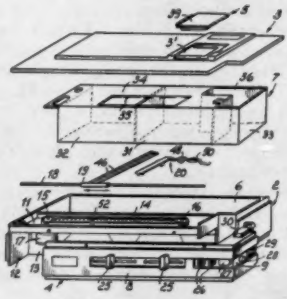
Giorgio Dragone, Via Redaelli, 2, Olginate (Como), Italy

Filed Sep. 30, 1977, Ser. No. 839,026

Claims priority, application Italy, Jan. 10, 1977, 19133 A/77

Int. Cl.[2] G03D 3/10

U.S. Cl. 354—310 **7 Claims**



1. An apparatus for developing exposed films, in particular X-ray exposed films as employed in dental applications, comprising an opaque housing, an opening in said housing, a cover for light-tight closing said opening, developing, fixing and washing baths for said films within said housing, entraining means movable along a path within said housing for entraining said films and causing immersion of said films into said developing, fixing and washing baths at subsequent times, wherein said cover defines a magazine for an exposed film wrapped in a protective wrapping having a closing tab and comprises a frame having at least one first seat therein, an exit mouth open toward said path of said entraining means and an edge adjacent said exit mouth to cause said tab of said wrapping inserted in said cover to become folded on said edge and slideably clamped between said cover and said housing and to project out of said housing when said cover is arranged within said opening, whereby pulling of said projecting tab causes advancement of said film along said at least one first seat out of said wrapping and said cover to said entraining means.

4,162,842

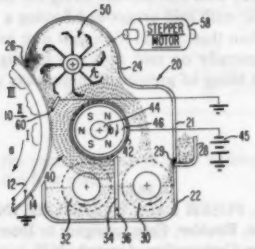
METHOD AND APPARATUS FOR DEVELOPING A LATENT, ELECTROSTATIC IMAGE IN NON-IMPACT PRINTING

Alexander C. Wu, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 763,307, Jan. 28, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,430

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 DD 14 Claims



2. Apparatus for developing a latent, electrostatic image on a dielectric surface comprising:

a source of particulate, ferromagnetic toner material;

magnetic brush means, in communication with said source, for receiving toner material from said source and rotationally transporting it past a first region on said dielectric surface to tone the latent, electrostatic image in the first region;

an impeller that rotates in circular motion about a single central axis thereof, said impeller for receiving residual toner material rotationally transported beyond the first region by said magnetic brush means and for impelling said received toner material toward a second region to tone the latent, electrostatic image in the second region; and

guide means that are curvilinear in shape, said guide means for guiding toner material centrifugally escaping said magnetic brush means toward a third region on said dielectric surface to form a toning cloud adjacent thereto to tone the latent, electrostatic image in the third region, said guide means being located adjacent the rotating impeller so that the rotating impeller assists the guide means by creating a vortex flow to facilitate the flow of toner material through the guide means.

4,162,843

COLOR ELECTROSTATIC COPYING MACHINE

Satoru Inoue; Masaakira Umehara; Kazuo Aramaki; Hideo Inuzuka, and Kouji Yamanobe, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 855,926

Claims priority, application Japan, Dec. 14, 1976, 51-149345; Dec. 28, 1976, 51-157626

Int. Cl.[2] G03G *15/01*

U.S. Cl. 355—4 13 Claims

1. A color electrostatic copying machine comprising:

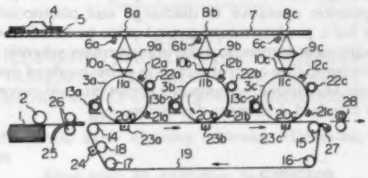
first, second and third photoconductive drums;

imaging means for radiating three light images of an original document in three primary colors onto the first, second and third drums to form three respective electrostatic images;

developing means for applying three toner substances of three primary colors to the first, second and third drums to develop the three electrostatic images and produce three primary color images respectively;

an endless belt for conveying a copy sheet into successive engagement with the first, second and third drums in register with the three color toner images respectively;

transfer charging means for applying an electrostatic charge to the belt of a first polarity which is opposite to a second polarity of the toner substances to successively transfer the three color toner images to the copy sheet; and



compensation means for counteracting an accumulation of charge of the second polarity on the copy sheet due to accumulation of toner substance thereon.

4,162,844

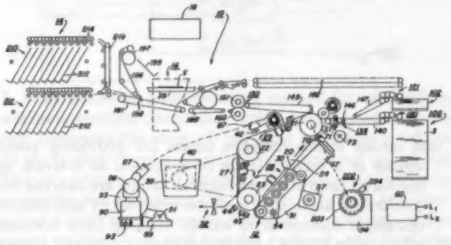
REPRODUCTION MACHINE WITH DUPLEX IMAGE SHIFT

Robert L. Traister, Penfield, and Stephen P. Wilczek, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,034

Int. Cl.[2] G03G *15/00;* C03B *27/76*

U.S. Cl. 355—14 6 Claims



3. In an electrostatic apparatus for producing copies of an original, having an apparatus including a moving photoreceptor; means for charging the photoreceptor in preparation for imaging; exposure means for generating latent electrostatic images of the original on the photoreceptor, the exposure means including illumination means; means for developing the latent electrostatic images; feeding means for bringing copy sheets into predetermined registered relationship with images developed on said photoreceptor; and transfer means for transferring images developed on the photoreceptor to both sides of the copy sheets,

the improvement comprising:

control means for selectively changing the operational timing of said illumination means to match the location of the developed image on one side of said copy sheet with the developed image on the other side of said copy sheet.

4,162,845

COPIER FOR GREATER THAN STANDARD LENGTH DOCUMENTS

Wayne R. Smith, Henrietta, and William G. Miller, East Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

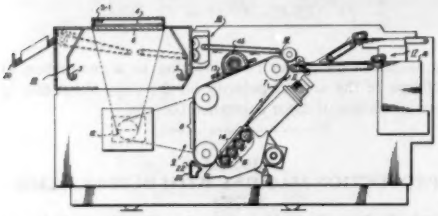
Filed Sep. 15, 1977, Ser. No. 833,424

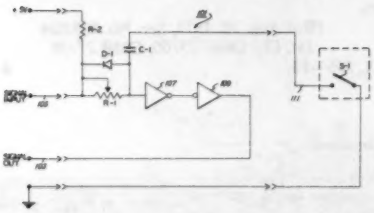
Int. Cl.[2] G03G *15/00;* G03B *27/76*

U.S. Cl. 355—14 3 Claims

1. In an electrostatic reproduction machine including a photoconductive member moveable past processing stations

including means for charging said member, means for exposing said member to document information to produce latent electrostatic images thereof on said member, means for developing the electrostatic images on said member and a discharge lamp positioned upstream from said developing means at a predetermined position operative to discharge said photoconductive member for a predetermined period prior to its advancing to the development station, and the improvement wherein circuit means for providing control signals in a first mode of operation to activate said discharge lamp at a preset interval corresponding to a standard document dimension,





said circuit means includes means for providing control signals in a second mode of operation to activate said discharge lamp at preset intervals which are delayed from a reference associated with the intervals of said standard document dimension to enable imaging from document information having a dimension greater than said standard document dimension, and

switching means for selecting either said first or second mode of operation at the option of a machine operator.

4,162,846

PHOTOGRAPHIC TYPE COMPOSING MACHINE AND METHOD

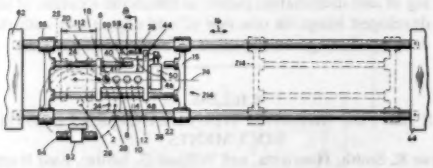
Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla. 33444

Filed Sep. 29, 1975, Ser. No. 617,847

Claims priority, application United Kingdom, Oct. 1, 1977, 42636/77

Int. Cl.[2] G03B *23/00*

U.S. Cl. 354—10 **44 Claims**



1. In a photographic type composing machine, the combination of a character matrix bearing a plurality of styles of characters, support means for defining a recording surface, lens means for projecting character images from said matrix towards said recording surface with a selectively variable size, drive means for driving said matrix relative to said recording surface, locking means for maintaining said matrix and said lens means in fixed relationship to one another so as to travel together during type composition and for permitting said matrix and said lens means to move relative to one another, and control means for selectively operating said locking means and said drive means to move said matrix and said lens means relative to one another for changing the size and/or style of the characters being composed.

22. A matrix disc for photocomposition, said disc bearing characters in concentric arrays, the characers in adjacent arrays being aligned with one another along the line tangent to a circle concentric with said arrays and having a diameter substantially less than that of said disc, said disc including a hub area located centrally on said disc and having a substantial area, said circle being of greater diameter than said hub area.

4,162,847

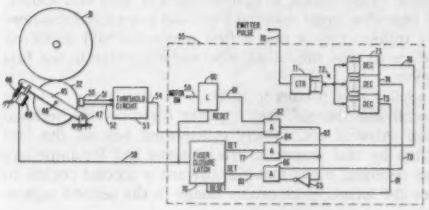
HOT ROLL FUSER EARLY CLOSURE INHIBITOR

Fred Y. Brandon, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,856

Int. Cl.[2] G03G *15/00*; F27B *9/28*

U.S. Cl. 355—14 **5 Claims**



1. In a copier system having a heated fuser roller and a backup roller with the rollers mounted for closure movement therebetween and with controls for causing roller closure for either a first or second predetermined time period prior to arrival of a sheet at the nip of the rollers where the first predetermined time period is longer than the second predetermined time period, the improvement comprising:

means responsive to the past history of the closure of the rollers for providing an output indicative that the backup roller temperature is approaching a level at which sheets tend to adhere to the backup roller, and

means responsive to said past history responsive means output for inhibiting the system controls from causing the first predetermined time period roller closure.

4,162,848

APPARATUS FOR SELECTIVELY COPYING FROM TWO DIFFERENT DOCUMENTS

Albert H. Platt, III, deceased, late of Pittsford, N.Y. (by Barbara B. Platt, administratrix), assignor to Eastman Kodak Company, Rochester, N.Y.

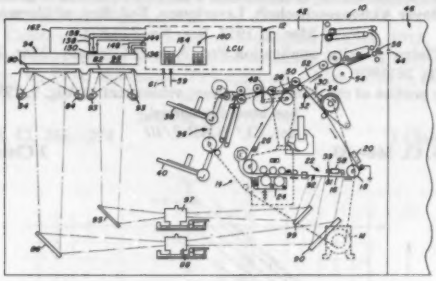
Filed Jul. 12, 1978, Ser. No. 923,873

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **9 Claims**

1. Document copying apparatus comprising: a first platen for receiving a document to be copied, a second platen spaced from the first platen for receiving another document to be copied, means operable when actuated for making copies of documents received on the respective platens, and control

means responsive to the presence of a document on the second platen for actuating said making means to make a copy of the



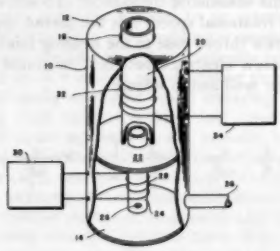
document on the second platen prior to making a copy of the document on the first platen.

4,162,849

SELECTED ELEMENT CONCENTRATION FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPIC MEASUREMENTS

Bernhard W. Huber, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,265
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712420; Jun. 4, 1977, 2705409
Int. Cl.[2] G01N *1/28*
U.S. Cl. 356—36 **22 Claims**



1. A method for concentrating a desired element of a sample in a graphite furnace tube for atomic absorption spectroscopy, said method comprising the steps of:

heating the sample to the vaporization temperature of the desired element in a zone near the bore of the graphite tube; and

maintaining said graphite tube at an elevated second temperature that is lower than said vaporization temperature whereby said desired element will condense on the inner surface of said graphite tube.

4,162,850

FIELD TEST FOR SCHISTOSOMA EGGS

Kenneth S. Warren, Cleveland, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Filed Mar. 1, 1976, Ser. No. 662,790
Int. Cl.[2] B01D *13/00*; C12K *1/04*; G01N *31/00, 33/16*
U.S. Cl. 356—38 **2 Claims**

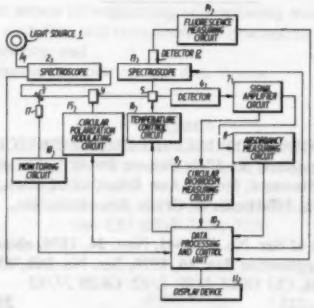
1. A process for rapidly ascertaining the presence of Schistosoma eggs in a patient comprising taking a urine sample from the patient, passing about 5 to 10ml of the urine sample through a substantially transparent microporous membrane having a diameter of about 10 to 20mm and pores of a maximum diameter of the order of about 10 μm, drying the membrane, wetting the membrane with saline solution, viewing substantially the entire membrane under a microscope at a magnification varying from about 25 to 50X, and counting any Schistosoma eggs viewed under the microscope.

4,162,851

SIMULTANEOUS PHOTOMETERING METHOD AND ASSEMBLY FOR MULTI-DIMENSIONAL MEASUREMENTS CONCERNING BIOLOGICALLY RELATED MATERIALS

Akiyoshi Wada, 11-4, Akasaka 8-chome, Minato-ku, Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,366
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—73 **3 Claims**



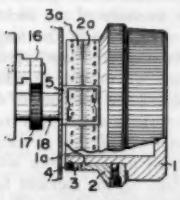
1. A simultaneous photometering method for multi-dimensional measurements concerning biologically related materials, which comprises the steps of: radiating periodically left and right alternating circular polarizations of selected wavelength lights onto given samples; detecting the transmissions through said samples and measuring the circular dichroism and absorbency at a time; simultaneously detecting the strength of fluorescence emitted from said samples radiated; and displaying and recording said circular dichroism, absorbency and fluorescent strength in correlative manners.

4,162,852

METHOD AND DEVICE FOR MEASURING DIOPTERS OF ASTIGMATIC LENSES

Taketoshi Ishihara, Sohka, and Yosiaki Watanabe, Ageo, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed May 13, 1977, Ser. No. 796,595
Claims priority, application Japan, May 15, 1976, 51-55527
Int. Cl.[2] G01B *9/00*
U.S. Cl. 356—125 **5 Claims**



1. Device for measuring diopters of astigmatic lenses, which comprises means for carrying a lens to be tested, means for providing a focusing plane, actuating means for providing a relative axial movement between said lens and said focusing

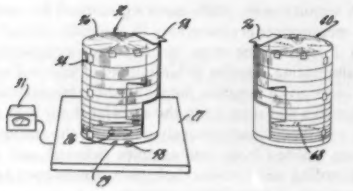
plane, a primary scale coupled with said actuating means so that it is moved together with said actuating means, and a secondary scale coupled with said actuating means so that it is moveable together with said actuating means and said primary scale when the actuating means is actuated, said secondary scale also being mounted for separate movement when it is actuated relative to the actuating means and the primary scale, said primary and secondary scales having the same but oppositely directed graduations and being positioned in proximity to each other and in opposed relationship so that they can be read together and index means fixed relative to the device for reading the primary and secondary scales.

4,162,853

ILLUMINATION MEASUREMENT DEVICE

Stephen S. Squillace, St. Clair Shores; David L. DiLaura, and Steven M. Stannard, both of Ann Arbor, all of Mich., assignors to Smith, Hinchman & Grylls Associates, Inc., Detroit, Mich.

Continuation of Ser. No. 744,641, Nov. 24, 1976, abandoned.
This application Jan. 16, 1978, Ser. No. 869,785
Int. Cl.[2] G01J *1/10, 1/42;* G02B *27/32*
U.S. Cl. 356—225 **28 Claims**



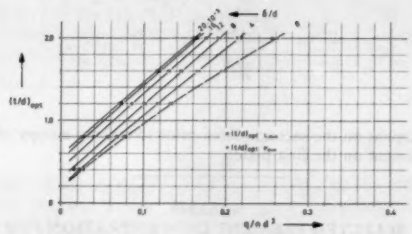
1. In a system for determining ESI of a lighting system for a known task and known background, the apparatus comprising: photometer means for providing an output signal having a magnitude varying in accordance with the intensity of light incident thereon and including a receiving device for receiving the incident light, and first envelope means for encasing said receiving device and for modulating the intensity of the incident light from the lighting system as a function of the magnitude of the background reflectance factor βb at preselected viewing angle whereby said photometer means will provide an indication of the magnitude of background luminance Lb and second envelope means for encasing said receiving device and for modulating the intensity of the incident light from the lighting system as a function of the magnitude of the task reflectance factor βt at a preselected viewing angle whereby said photometer means will provide an indication of the magnitude of task luminance Lt, at least one of said first and second envelope means comprising a first light transmitting envelope with the transmittance of said first envelope varying at selectively spaced locations in accordance with variations in the reflectance β effective on the incident light at each of said spaced locations, said first envelope having at least at some of said spaced locations blocking means being generally opaque for blocking out a preselected portion thereof such that the total transmittance through said some of said spaced locations has a magnitude related to the magnitude of reflectance β effective on the incident light therethrough.

4,162,854

MULTI-SHAFT SCREW EXTRUDER

Martin Ullrich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,871
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611908
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] B29B *1/10*
U.S. Cl. 366—83 **2 Claims**



1. A multi-shaft screw extruder with screw shafts arranged intermeshing in pairs and rotating in the same sense in pairs of which each screw shaft of a pair has at least one double or triple threaded pressure build-up section corresponding to that of the other screw shaft, wherein at least part of the pressure build-up sections have a ratio of screw pitch t to housing internal diameter d which lies within the range of the following relationship:

$0.7 \cdot f(h/d, \delta/d, q/nd^3) < t/d < 1.8 \cdot f(h/d, \delta/d, q/nd^3)$,

where q is the volumetric throughout of a screw pair, n is the screw shaft rotational speed, h is the thread depth, measured from the screw thread base to the housing inner wall and δ is the radial screw clearance between the screw crest and the housing inner wall and in which:

$$f\left(\frac{h}{d}, \frac{\delta}{d}, \frac{q}{nd^3}\right) = \frac{A}{\frac{h}{d}} \cdot \left[a + b \cdot \frac{q}{nd^3} + c \cdot \left(\frac{q}{nd^3}\right)^2\right]$$

and

$$a = a_0 + b_0 \cdot (\delta/d) + c_0 \cdot (\delta/d)^2 + d_0 \cdot (67/d)^3$$

$$b = a_1 + b_1 \cdot (\delta/d) + c_1 \cdot (\delta/d)^2 + d_1 \cdot (\delta/d)^3$$

$$c = a_2 + b_2 \cdot (\delta/d) + c_2 \cdot (\delta/d)^2 + d_2 \cdot (\delta/d)^3$$

in which in the case of triple threaded pressure build-up sections A = 0.1082

$a_0 = 0.18173$	$b_0 = -9.9396$	$c_0 = 3926.6$	$d_0 = -122\,604$
$a_1 = 8.2230$	$b_1 = 170.46$	$c_1 = -10\,833$	$d_1 = 219\,048$
$a_2 = -4.8033$	$b_2 = 1053.6$	$c_2 = -80\,154$	$d_2 = 1\,793\,827$

and in which in the case of double threaded pressure build-up sections A = 0.206

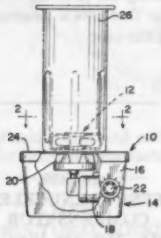
$a_0 = 0.18175$	$b_0 = -4.970$	$c_0 = 981.65$	$d_0 = -15\,325$
$a_1 = 5.1394$	$b_1 = 53.267$	$c_1 = -1692.6$	$d_1 = 17\,113$
$a_2 = -1.8763$	$b_2 = 205.78$	$c_2 = -7827.6$	$d_2 = 87\,589$

and where the following relations are valid: f(h/d, δ/d, $q/nd^3 < 2.0$; $q/nd^3 > 0.01$; $0.0015 < \delta/d < 0.02$; and $0.06 < (h/d)$ triple threaded < 0.13 1 and $0.11 < (h.d)$ double threaded < 0.29.

4,162,855
MAGNETIC STIRRER APPARATUS

Charles E. Bender, Fairfield, Pa., assignor to Spectroderm International, Inc., Fairfax, Va.

Continuation-in-part of Ser. No. 622,013, Oct. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 524,788, Nov. 18, 1974, abandoned. This application Mar. 4, 1977, Ser. No. 774,422
Int. Cl.[2] B01F *13/08*
U.S. Cl. 366—274 2 Claims



1. A stirrer apparatus particularly adapted for magnetic coupling to a magnetic drive to agitate a substance, such as a fluid, culture, sample or the like contained in a vessel when moved by the magnetic drive, including stirrer positioning means disposed within said vessel containing said substance to be agitated and independent therefrom, said stirrer positioning means including a positioning cage having a central mounting portion and a vessel engaging portion of substantially fixed vertical and horizontal dimensions extending radially outwardly therefrom, rotor assembly means rotatably mounted on said stirrer positioning means and being supported thereby within said vessel, generally parallel to an interior surface thereof and to said magnetic drive, said rotor assembly means being magnetically coupled to and magnetically rotatable by said magnetic drive at a desired speed relative to said vessel, said radially outwardly extending vessel engaging portion of said positioning cage extends beyond said rotor assembly means, and said rotor assembly means includes hub means formed for mounting within said central mounting portion of said positioning cage, said hub means being freely movably relative thereto, and magnetic impeller means mounted on said hub means for rotation therewith relative to said vessel, said hub means including spaced upper and lower collar members with said cage comprising an open substantially flat and horizontal wire means to provide said cage, said hub means having a generally vertical passageway formed therein along an axis of rotation of said hub means, said passageway being capable of receiving fluid supply means therethrough, a portion of said fluid supply means being disposed below said hub means for introducing or drawing fluid from said vessel.

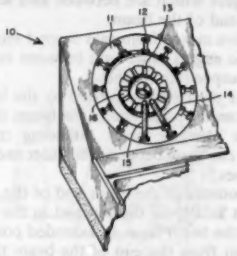
4,162,856
AGITATION APPARATUS

William W. Bassett, Wayzata, and Eugene D. Johnson, Spring Lake Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 689,879, May 25, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,659
Int. Cl.[2] B01F *9/02*
U.S. Cl. 366—213 6 Claims

1. An apparatus for the low speed agitation of fluids comprising:

rotatable agitating means, said agitating means further comprising, a disc-shaped member having a plurality of recesses in the surface thereof for receiving single containers of fluid to be agitated such that the normally vertically disposed axes of the containers are parallel to the plane of the disc and wherein said recesses are completely open above the plane of said disc such that said containers are retained solely by gravity therein and may be placed therein or removed therefrom during the rotation of said disc;



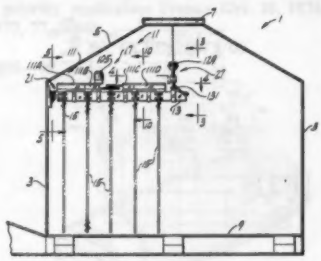
support means for supporting said agitating means at a position such that said containers are retained in said recesses by gravity; and

drive means for rotating said disc means.

4,162,857
APPARATUS FOR STIRRING GRAIN

Gary A. Spurling, Taylorville, Ill., assignor to Specialized Products, Inc., Taylorville, Ill.

Filed Dec. 12, 1977, Ser. No. 859,322
Int. Cl.[2] B01F *7/24, 7/30*
U.S. Cl. 366—261 18 Claims



1. Apparatus for stirring a mass of grain stored in a bin, the bin having a cylindrical wall and a roof, and a track extending in a circle around the inside of the wall in a generally horizontal plane above the level of grain in the bin, the track being mounted on supports spaced at intervals around the inside of the wall, said apparatus comprising

a beam;

means for mounting the beam for swinging in a generally horizontal plane above the grain about the vertical central axis of the bin, said beam mounting means comprising means for suspending the beam from the roof of the bin adjacent one end of the beam constituting its inner end and providing a pivot for the beam to swing around the bin generally on its said vertical central axis, the beam extending out from said suspending means toward the bin wall, a carriage at the other end of the beam constituting its outer end, and wheels on the carriage adapted to roll on said track;

an electric motor carried by the carriage;

a drive from said electric motor to at least one of said wheels for driving the carriage around the track thereby to swing the beam around said central vertical axis;

a plurality of augers carried by the beam extending down from the beam at spaced intervals along the length of the beam;

a plurality of bearing means, one for each auger, mounted on one side of the beam, the upper ends of the augers extending up above the top of the beam;

a second electric motor carried by the beam at a location between the ends of the beam;
a first drive means from said second motor to the upper ends of the augers which are between said second motor and the outer end of the beam;
a second drive means from said second motor to the upper ends of the augers which are between said second motor and said suspending means;
a retainer for the carriage carried by the beam spaced outwardly from the outer end of the beam; the carriage comprising an elongate body extending transversely with respect to the beam between the outer end of the beam and said retainer;
and a pin mounted at the outer end of the beam for sliding movement axially of the pin and in the direction of the length of the beam from an extended position in which it extends out from the end of the beam through said carriage and into a hole in the retainer, to a retracted position in which the pin is retracted from the carriage for removal of the carriage from the beam.

4,162,858

STYLUS PRINTER IMPACT ENERGY CONTROL

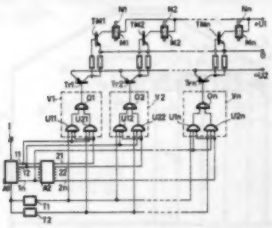
Klaus Brandenburg, Wehbach, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,757

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635398

Int. Cl.[2] B41J *3/12*

U.S. Cl. 400—124 **1 Claim**



1. A stylus printer, comprising a number of printing styli which are arranged one underneath the other, each stylus being movable by an electromagnet so as to print a dot on a record carrier, the arrangement being such that a character to be printed can be built up in columns by selective actuation of the magnets in combiantion with a relative movement of the record carrier with respect to the printing styli, a magnet being actuated by one energy pulse or by a series of energy pulses, depending on the shape of the character to be printed, further including means for the selective actuation of the magnets including means for control including means to determine whether a magnet to be actuated has already been actuated during the printing of the directly preceding column, and to supply a magnet where this is the case with a pulse containing a quantity of energy which is smaller than that applied to a magnet where this is not the case,
said means for control including means to vary the energy of the pulses by variation of the pulse length,
said means for control further including a clock generator which is capable of controlling a number of switches, each of which actuates one of the magnets when actuated, and also comprising a register which is adapted to store per column to be printed the data indicating which magnets are to be actuated and to supply a pulse from the clock generator to the relevant switches or not in dependence of these data, and further including two registers which are connected to each other so that each time after the printing of a column the contents of the first register are transferred to the second register, there being provided two clock generators which generate pulse series having the same frequency, the pulses of the first clock generator having a duration longer than those of the second clock generator, each output of the first register being connected, together with the corresponding output of the second register, via a logic network, to the associated switch, said means for control conducting a pulse from one of the clock generators when the first register indicates that the relevant stylus must print a dot, a pulse from the second clock generator being conducted when the second register indicates that the same stylus has also printed a dot during the printing of the previous column, a pulse from the first clock generator being conducted when this is not the case.

4,162,859

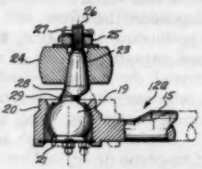
VEHICLE STEERING KNUCKLE ARM ANGLE COMPENSATOR

Loyd O. McAfee, 4441 - 26th Ave. West, Seattle, Wash. 98199

Filed Dec. 27, 1977, Ser. No. 864,521

Int. Cl.[2] F16C *11/00*; F16D *1/12, 3/00*

U.S. Cl. 403—75 **15 Claims**



1. Vehicle steering knuckle arm angle compensator means comprising a tie rod adjustable in effective length and having a spherical ball joint component, and a connector including a spherical ball joint component complemental to and fitted with said tie rod ball joint component and a shank projecting generally radially from said connector ball joint component, said shank having a joint portion spaced from said connector ball joint component for attachment to a steering knuckle arm and swivelably adjustable relative thereto as said ball joint components are relatively swivelably adjusted and said shank further having an offset rigidly connecting said connector ball joint component and said joint portion.

4,162,860

FLANGE-SCREW CONNECTION FOR RODS IN THREE-DIMENSIONAL FRAMEWORKS

Max Mengeringhausen, and Reinhard Schmidek, both of Würzburg, Fed. Rep. of Germany, assignors to MERO-Raumstruktur GmbH & Co., Würzburg, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,343

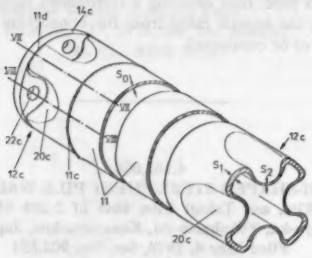
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743269

Int. Cl.[2] F16B *9/02*; F16L *41/00*

U.S. Cl. 403—199 **7 Claims**

1. A flange-screw connection between a rod and a junction means comprising corresponding support surfaces, characterized in that a flange (14) is secured to a connecting part (12) provided at the end of the rod which is of such cross-section as to have the same (area) moment of inertia as the rod (11), the

flange comprising bores (22) adapted to receive fastening screws (21) therethrough, said bores being disposed close to



the outer periphery of said flange and each terminating in an insertion-cavity (20) for receiving the fastening screws.

4,162,861

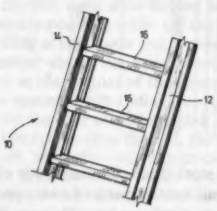
STRUCTURAL JOINT

Robert Reid, Willowdale, and Kaljo Lustvee, Islington, both of Canada, assignors to Daymond Limited, Mississauga, Canada

Filed Jan. 5, 1978, Ser. No. 867,289

Int. Cl.[2] B25G *3/00*; F16B *7/00, 12/08*; F16L *41/00*

U.S. Cl. 403—242 4 Claims



1. A structural joint formed upon joining two elements, said first element having a flange portion of malleable material, said second element having an elongate recess with an arcuate internal surface, the recess edges defining an elongate entrance to said recess where a leg defines at least an upper part of said recess internal surface, the extremity of said leg defining an edge of said recess, said first element having a rigid tongue portion spaced from said flange by a gap which is adapted to receive said leg on joing formation, said flange being deformed in said recess to form at least a portion of a coil therein which contacts the recesses' internal surface, said leg having an overturned portion which overlies a portion of said deformed flange to define a recess entrance smaller than the coiled flange, said leg having an abutment which abuts a longitudinally extending portion of a side of said tongue to clamp said leg between said tongue side and coiled flange, the arrangement being such that when a force is exerted to remove the coiled flange from the recess the clamping action on said leg is increased by virtue of said leg abutment interfering with and binding against said longitudinally extending side portion of said tongue.

4,162,862

PAVEMENT STRIPING APPARATUS AND METHOD

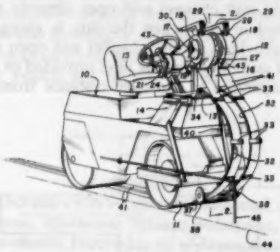
James S. Harker, 5232 Hickory Pl.; Earl J. Harris, 1411 Morrie Ave., and Edward L. Haak, 5020 Greybull Ave., all of Cheyenne, Wyo. 82001

Filed Apr. 7, 1978, Ser. No. 894,440

Int. Cl.[2] E01C *23/16*

U.S. Cl. 404—72 9 Claims

8. A method of applying striping tape to fresh hot asphaltic pavement during the finish rolling of the pavement in a single combined operation, comprising the steps of rolling fresh hot asphaltic paving material to produce a finished wear surface thereon, simultaneously utilizing the rolling movement of a pavement roller to continually pull pavement striping tape from a tape source, and positively guiding said striping tape



during its movement from said source so that the tape is continually delivered onto the pavement immediately in advance of said roller and substantially at the nip defined between the roller and pavement.

4,162,863

DEVICE FOR SOIL IRRIGATION

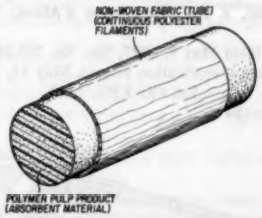
Yves Gaudard; Henri Guillemaud, both of Lyons, and Jacques Perfetti, Caluire, all of France, assignors to Rhone-Poulenc-Textile, Lyons, France

Filed Oct. 14, 1977, Ser. No. 842,311

Claims priority, application France, Oct. 28, 1976, 76 32941; Jan. 7, 1977, 77 20549

Int. Cl.[2] E02B *13/00*

U.S. Cl. 405—45 7 Claims



1. An irrigation system for the irrigation of soils to facilitate the growth of plants, trees, crops or germination of seeds, wherein it is desired to regulate and meter the moisture level of soil, said system comprising an absorbent product filling contained within a permeable textile filter envelope, wherein the absorbent product filling is an amorphous, synthetic polymer pulp or a textile in the form of a tow of hydrophilic continuous filaments, said system being connected to and in fluid flow communication with a liquid supply source.

4,162,864

SYSTEM FOR AND METHOD OF MOVING SEA WATER BY UTILIZING TIDAL FLOW AND EBB

Yoshiki Maeda, and Chikako Maeda, both of 20-1-1361, Moto-Machi Hiroshima-shi, Hiroshima-ken, Japan

Filed Oct. 14, 1977, Ser. No. 842,149

Claims priority, application Japan, Oct. 16, 1976, 51-124102; Mar. 12, 1977, 52-27445; Jul. 30, 1977, 52-91521

Int. Cl.[2] E02B *9/00, 9/04*

U.S. Cl. 405—75 23 Claims

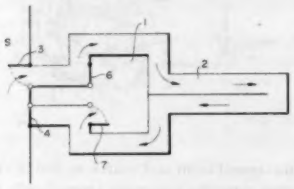
1. A system for moving seawater by utilizing tidal flow and ebb comprising:

at least one reservoir,

at least one floodgate for inlet and at least one floodgate for outlet provided on said reservoir,

at least one channel having two opposite ends respectively connected to said floodgates of the reservoir, and

at least one inlet floodgate and at least one outlet floodgate provided on said channel and open directly to the sea, characterized in that when the tide is rising, the inlet floodgate provided on the channel and open directly to the sea and said floodgate for inlet provided on said reservoir and separated at a certain distance from said inlet



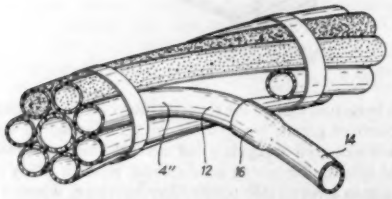
floodgate are opened, whereas an outlet floodgate provided on the channel and open directly to the sea and said floodgate for outlet provided on said reservoir, and separated at a certain distance from said outlet floodgate are shut, thereby producing the current of the seawater through the channel in a direction; and when the tide is receding, said floodgate for inlet and said inlet floodgate are shut and said floodgate for outlet and said outlet floodgate are opened, thereby maintaining the current through the channel in the same direction as in the case of the rising tide.

4,162,865

METHOD FOR LAYING CARRIER CABLES, SUCH AS TELEPHONE LINES

Philippe Aubet, 3, rue des Princes d'Albon, Yvetot, France (76190)

Filed May 9, 1977, Ser. No. 795,282
Claims priority, application France, May 13, 1976, 76 14400
Int. Cl.[2] F16L *1/00*
U.S. Cl. 405—154 **2 Claims**



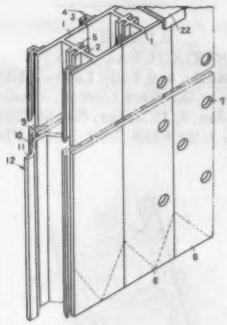
1. A method for laying carrier cables, such as telecommunication lines (telephone, telex, connection by cable from a television relay) and for connecting individual users to a distribution system, whereby at least one linear main cable is buried and adapted to receive junctions made from place to place to connect secondary branch cables supplying individual apparatus, said method comprising the steps of burying a bundle of tubular pipes connected at one end to at least one connection box supplied by a main cable, the main cable being engaged in one of the pipes of the bundle, from one end of said pipe to the other, at least certain of the pipes assembled together in a bundle are left empty when the bundle (containing the main cable) is laid and they are buried with the bundle assembly, after which, when a new subscriber is subsequently to be connected, the bundle is unearthed at the location of the connection to be made and one of the empty pipes forming part of the bundle is severed, a secondary branch cable is passed from a connection box into the section of this pipe, emerging therefrom at the severed end thereof, this secondary branch cable is then engaged in and conveyed by a secondary connection pipe terminating at the apparatus to be supplied, the free end of the severed pipe is securely connected to the inlet of the secondary connection pipe, thus ensuring a continuous tubular support conveying the branch cable from the connection box to the apparatus to be connected.

4,162,866

H-SHAPED STEEL SHEET PILE WALL

Takeichi Kita, and Takuji Kita, both of 2-288 Mineoka-cho, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed May 4, 1978, Ser. No. 902,891
Int. Cl.[2] E02D *5/08*
U.S. Cl. 405—277 **3 Claims**



1. An H-shaped steel sheet pile wall made of H-shaped units wherein in each unit central parts of two opposing side plates (1) are coupled by a coupling plate (2) comprising in combination:

(a) AH-shaped steel sheet pile units (6) each unit of which is formed with an engaging piece (3) at one edge of the side plate (1) and fitting piece means (4) adapted to fit said engaging piece (3), at the other edge of said side plate in a manner to be continuous along the respective edges of the side plates;

(b) fitting grooves (5) on both opposite surfaces of the coupling plates (2) in each unit in a manner to extend in a lengthwise direction of said coupling plate in opposition to each other;

(c) BH-shaped steel sheet pile units (8) each of which is provided with opposing apertures (7) at predetermined positions of both said side plates (1) of the AH-shaped steel sheet pile;

(d) joining reinforcement members (12) in the form of a trestle, with two edges, each of which has at both its edges protuberant pieces (11) adapted to fit said fitting grooves (5) of the adjacent and opposing coupling plates of the coupled steel sheet piles;

(e) A top piece (9) and oblique pieces (10) on each joining reinforcement member (12), contacting with the rear surface of connected parts of said side plates so that the sheet piles are fitted and coupled into one row by the use of said joining reinforcement members (11), the protuberant pieces (11) fitting snugly into the grooves (5) and being integrally molded at both edges thereof; and,

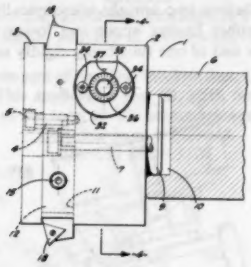
(f) a partition plate (13) for closing the open surface of the H-shaped steel plate (6,8) with engaging pieces (14) which snugly fit the engaging pieces (3) and fitting piece means (4), and having fitting grooves (15) in which said protuberant pieces (11) are fitted.

4,162,867

DUAL CUTTER BORING HEAD

Donald J. Calcaterra; Robert A. Rhinefrank, both of Stockton, and Donald W. Barton, Manteca, all of Calif., assignors to Carando Machine Works, Stockton, Calif.

Filed Apr. 17, 1978, Ser. No. 896,681
Int. Cl.[2] B23B 51/00
U.S. Cl. 408—157 8 Claims



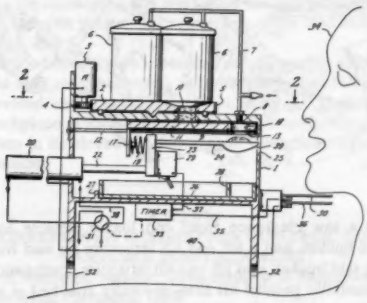
1. A dual cutter boring head comprising a body adapted for rotation about a predetermined axis, the body having a diametral channel therein, a pair of tool-holding slides disposed in side-by-side relation in the channel, the channel having a bottom, means retaining the slides in the channel in engagement with the bottom thereof, each slide having an outer end projecting from a corresponding side of the body, a cutter mounted on each slide at said outer end, a member journaled in the body for rotation about the axis thereof, such member having a face open to the bottom of the channel, a pair of pins on said member in spaced-apart, radially-opposed relation, the pins projecting from the face of said member into the channel, the slides having transverse slots therein, the pins engaging in corresponding slots whereby—upon part-circle rotation of such member—the pins move the slides in opposition in the channel to adjust the cutters, means on the body operable from exteriorly thereof arranged to cause such part-circle rotation of said member, and releasable means normally securing the slides against movement in the channel.

4,162,868

INVALID FEEDING DEVICE

Patrick Stapleton, 1738 Colquitt; Hubbard P. Browne, 1627 Colquitt, both of Houston, Tex. 77098, and Dallas D. Weatherholt, 13207 Buxley, Houston, Tex. 77045

Filed Dec. 20, 1977, Ser. No. 862,655
Int. Cl.[2] A47G 21/08
U.S. Cl. 414—9 1 Claim



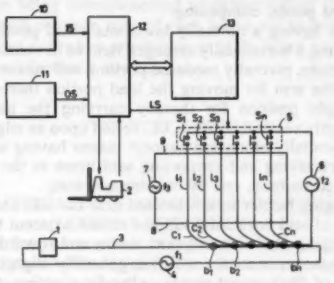
1. In an invalid feeding device, a housing, a food container table on said housing, a port extending therethrough, food transport means reciprocally mounted in said housing, a movable table mounted in said housing between the upper wall thereof and said transport, a port in said table, means for moving said table into alignment with said port in said food container table and in sequence into alignment with said food transport, means for moving said food transport out of said housing into invalid feeding position, a removable spill tray anchored in said housing, a switch carried by said transport which moves against said spill tray at the end of each stroke to actuate said switch and reverse the movement of said transport.

4,162,869

UNMANNED CONVEYING CONTROL SYSTEM

Shinichi Hitomi, Hiratsuka; Tetsuya Nakayama, Fujisawa, and Tetsuji Funabashi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,995
Claims priority, application Japan, Aug. 6, 1976, 51-93786; Aug. 6, 1976, 51-93789; Aug. 6, 1976, 51-93792
Int. Cl.[2] B65G 67/00
U.S. Cl. 414—70 6 Claims

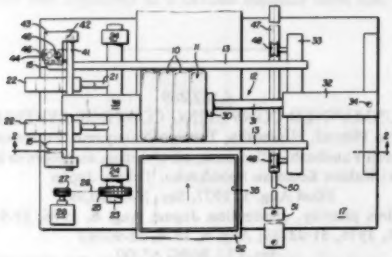


1. An unmanned conveying control system comprising:
main leader cables energized by a guide signal of a first frequency;
lane leader cables energized by a guide signal of a second frequency;
an unmanned travelling vehicle running along said leader cables for conveying a load, said vehicle being guided by the guide signals flowing through said leader cables;
means for superimposing upon said first and second frequencies a third frequency corresponding to the storing of a load and a fourth frequency corresponding to the delivering out of a load;
a memory for storing data including the position of a load placed on a lane in a work area and the number of layers of the load;
means for rewriting the contents of said memory each time an operation of storing or delivering out of the load is completed;
leader cable selection means for selecting suitable ones from among said leader cables for forming a load conveying way between a predetermined base position and a desired position in the work area;
a central control unit for controlling said leader cable selection means and giving load conveying instructions to said vehicle in accordance with the contents of said memory; and
loading and unloading control means mounted on said vehicle for detecting the presence or absence of a load in front of said vehicle and the number of layers of the load and for loading and unloading the load in response to said load conveying instructions.

4,162,870
HORIZONTAL STACKER FOR BAKED GOODS AND THE LIKE

Donald W. Storm, 5857 Upper Straits Blvd., Orchard Lake, Mich. 48033

Filed Sep. 22, 1977, Ser. No. 835,450
Int. Cl.[2] B65G *57/00*
U.S. Cl. 414—107 3 Claims



1. A horizontal stacker for relatively flattened, roughly disk shaped, soft items, such as baked muffins, doughnuts and the like baked goods, comprising:

an arm having a normally horizontal, load portion for receiving a horizontally arranged item to be stacked, and an opposite, pivotally mounted portion, and means for pivoting the arm for moving the load portion thereof into an upright position for thereby carrying the item into a roughly vertical position, i.e., rested upon an edge thereof;

a horizontally elongated support means having a load end for receiving and supporting said items as the items are placed thereon, one by one, by said arm;

a swinging barrier means located near the arm and the portion of said horizontal support means adjacent the arm of swinging above the support means and towards the support means in an arc which is generally aligned with the axis of the support means, whereby pivoting of the arm loaded with an item causes the barrier means to swing upwardly to clear the item and then to swing downwardly again to support the item against horizontal movement in the direction of the load end;

a force applying means for applying a horizontal force in a direction axial of the support means, i.e., towards the load end thereof, against the item furthest from the load end for compacting the stack of items against the barrier, with said force applying means moving in response to the addition of further items to the stack formed on the support means to maintain a relatively uniform low level force to the horizontal stack of items;

spaced apart guide means having portions being generally parallel to said horizontally elongated support means, said items being supported by said support means between said guide means, said support means and said guide means comprising wire-like elements arranged beneath and along the opposite sides of the stacked items;

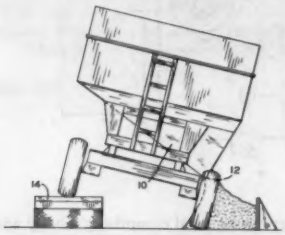
and means for moving said wire-like support means in a direction parallel to the plane in which the wire-like guide means lie to thereby release the horizontally stacked items as a unit.

4,162,871
SIDE-LIFTING APPARATUS FOR HOPPER WAGONS

James W. Norden, P.O. Box 242, Woodburn, Ind. 46797

Filed Mar. 3, 1978, Ser. No. 883,326
Int. Cl.[2] B65G *67/42*
U.S. Cl. 414—376 7 Claims

1. A side-lifting apparatus for side-dumping wagons having front and rear wheels on opposite sides thereof, comprising a horizontal platform device onto which a wagon may be rested having stationary and vertically movable sections, said vertically movable section being elongated having opposite parallel sides, said movable section further being positioned to support the front and rear wheels on one side of a wagon disposed on said platform device and movable from a first position level with said stationary section to a second position thereabove; a pair of power-lifting mechanisms disposed beneath and connected to and supporting the opposite end portions of said movable section to maintain the latter level and selectively to raise it above the level of said stationary section thereby to tilt a wagon resting thereon sideways, each of said power-lifting mechanisms including two upright telescopically slidably engaged guiding tubes having upper and lower ends, respectively, the upper end of one tube being rigidly secured to said

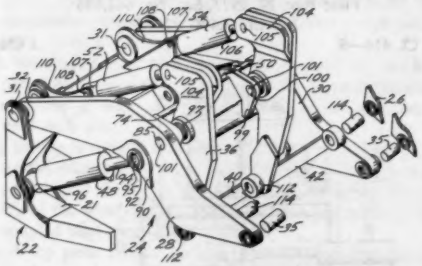


movable platform section, a rigid stationary frame, said other tube being rigidly secured at its lower end to said stationary frame, double acting fluid power cylinders disposed within said tubes, respectively, and having the piston rod connected to one and the cylinder operatively connected to the other of said tubes whereby actuation of said power cylinders telescopes said tubes, said tubes overlapping in telescoped relation when said movable section is in either of its first and second positions and supporting said movable section against any move other than vertical, whereby said movable section may be elevated and lowered in level horizontal condition by selective actuation of said pair of power-lifting mechanisms.

4,162,872
LIFT ARM ASSEMBLY

Frank A. Grooss, Morton, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1977, Ser. No. 859,362
Int. Cl.[2] E02F *3/82*
U.S. Cl. 414—713 14 Claims



1. In a low clearance front end loader vehicle having a frame, a bucket, and a lift and tilt structure on said frame for moving said bucket, said lift and tilt structure comprising a pair of substantially parallel lift arms pivotally attached at one end to said frame and at the other end to said bucket, a crossbrace extending between and being attached to said lift arms, said crossbrace being tubular in cross section and having a longitudinal web therein for adding torsional strength to said crossbrace, said crossbrace having end plates rigidly secured

thereto, said end plates being secured to the inside faces of said spaced lift arms, a lift cylinder pivotally connected between said frame and each of said lift arms, a pair of tilt arms pivotally connected to said lift arms, a tilt cylinder pivotally connected to each of said tilt arms and to said frame, and means connecting said tilt arms to said bucket above the connection of said lift arms to said bucket.

4,162,873

EXTENSIBLE BOOM LIFT

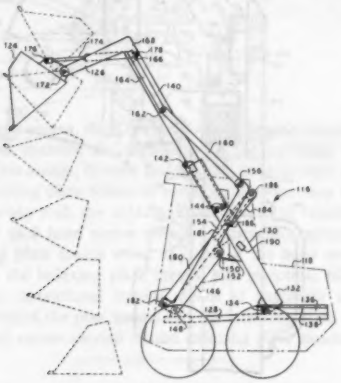
Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 758,810, Jan. 12, 1977, Pat. No. 4,070,807. This application Jan. 30, 1978, Ser. No. 873,597

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] E02F *3/70*

U.S. Cl. 414—718 **16 Claims**



1. A lift for raising a workpiece, comprising:

a pivotal boom having an extensible load end terminating in an upper reach and a pivot end;

means for supporting said boom so that said boom pivot end is horizontally movable but substantially vertically fixed;

a support arm having one end held from substantial horizontal motion and pivotally mounted for rotation about a substantially horizontal axis and a second end pivotally mounted to said boom;

means for raising and lowering said boom so that as said boom load end is elevated, its boom pivot end responds by moving substantially horizontally toward said support arm;

a workpiece arm extending from the load end of said boom;

means for supporting the workpiece on said workpiece arm at a location below the upper reach of the load end of said boom; and

means for continuously extending said extensible load end as said load end is elevated, whereby said workpiece arm is elevated and lifts the workpiece in an arc such that the workpiece is extended farther horizontally from the lift when in its elevated position than when in its unelevated position.

4,162,874

HORSEPOWER SUMMATION CONTROL FOR VARIABLE DISPLACEMENT

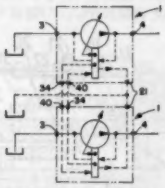
Walter E. Marietta, Mentor, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 7, 1977, Ser. No. 848,786

Int. Cl.[2] F04B *49/00*

U.S. Cl. 417—216 **8 Claims**

1. A horsepower summation control for first and second variable displacement pumps each having pump means, high and low fluid pressure zones, displacement adjusting means including a fluid pressure operated member to increase the displacement of said pump means in response to increase in fluid pressure in said high pressure zone, pressure compensating means operative, upon increase of fluid pressure in said high pressure zone to a predetermined value, to intercommunicate said high and low pressure zones for movement of said member in displacement decreasing direction, a spring-biased



horsepower control valve, a spring-biased displacement feedback control valve, and cam means on said fluid pressure operated member operative upon movement in displacement decreasing direction to increase the spring bias on said valves; said pumps being interconnected to define a fluid flow path from the high pressure zone of each pump via its horsepower control valve to the low pressure zone of the other pump via its displacement feedback control valve.

4,162,875

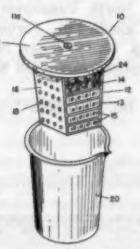
DECALCIFICATION CABINET FOR OSSEOUS AND DENTAL SPECIMENS

Virginia J. Lux, Dover, Del., and Peter J. Tsaknis, Mt. Airy, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,388

Int. Cl.[2] B01F *13/08*

U.S. Cl. 366—273 **4 Claims**

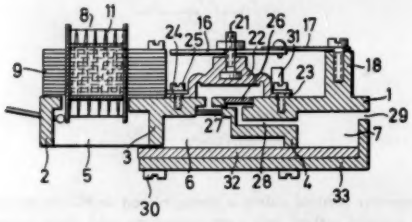


1. An apparatus for decalcifying osseous and dental tissues comprising a container of decalcifying solution, a cabinet including a top portion and base portion, said base portion including a plurality of drawers therein, said cabinet and drawers containing a plurality of holes therein through which a decalcifying solution can flow, said top portion having support edges which extend laterally outwardly from the sides of the base portion of the cabinet for suspending said cabinet in said container, said top portion of said container resting on the upper edges of the container so that said base portion is suspended within said solution above the base of the container and providing closure means for preventing the escape of fluids from said container, a stirring magnet for stirring the decalcifying solution being positioned in said solution beneath said cabinet.

4,162,876
ELECTROMAGNETICALLY DRIVEN DIAPHRAGM PUMP

Erwin Kolfertz, Bebelallee 9, Solingen-Merscheid, Fed. Rep. of Germany (5650)

Filed Jan. 4, 1977, Ser. No. 756,695
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603098; Oct. 7, 1976, 2645175
Int. Cl.[2] F04B *43/00*
U.S. Cl. 417—413 26 Claims

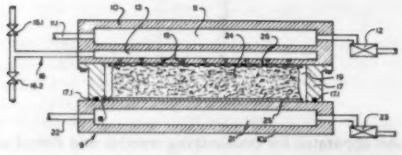


1. A diaphragm pump having means including a diaphragm defining a pumping chamber, an arm mounted for oscillating movement, means connecting said arm to said diaphragm and electromagnet means for oscillating said arm to move said diaphragm to and fro, said electromagnet means including core means having pole faces and coil means adpated, when energized, to produce a magnetic field including principal lines of magnetic force and said arm being mounted for said oscillating movement in a plane which is perpendicular to said principal lines of magnetic force and parallel to said pole faces, a half-wave rectifier having an input and an output, an alternating current supply, means connecting said input to said alternating current supply, means connecting one end of said coil means to said output and means for connecting the other end of said coil means to said alternating current supply.

4,162,877
METHOD AND APPARATUS FOR CONSOLIDATING PARTICLE BOARD

Donald W. Nyberg, North Vancouver, Canada; assignors to Hawker Siddeley Canada Ltd., Toronto, Canada.

Filed Sep. 16, 1977, Ser. No. 834,050
Claims priority, application United Kingdom, Sep. 23, 1976, 39437/76
Int. Cl.[2] B29J *5/04*
U.S. Cl. 425—84 4 Claims



1. In a press for compressing a mat of fibrous particles in the production of particle board:

(a) a pair of upper and lower heated platens having confronting pressing faces and movable between open and closed positions,

(b) a solid non-porous metallic caul plate for transporting the mat into position between the platens,

(c) peripheral sealing means on one of the platens for effecting sealing engagement with the other of the platens so as to provide a sealed chamber enclosing the mat and caul plate as the platens are moved into compressing engagement with the mat,

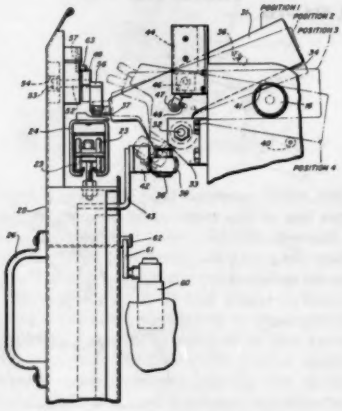
(d) a labyrinth extending through the upper platen connectable selectively to a source of steam and a source of suction,

(e) a plurality of passages extending from the labyrinth and opening through the pressing face of the upper platen to enable steam to be injected into and exhausted from the chamber.

4,162,878
SAFETY LATCH SYSTEM

Thomas C. Puglisi, Kensington, and Kurt M. Strobel, Southington, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.

Filed Nov. 21, 1977, Ser. No. 853,394
Int. Cl.[2] B29F *1/00*
U.S. Cl. 425—152 9 Claims



1. In an injection molding machine having first and second mold halves, said mold halves being mounted on first and second platens which are movable to cycle said mold halves from an open position to a closed position and back to an open position, and a safety gate which is movable from an open position allowing access to the mold halves to a closed position in which access is blocked, a mechanism comprising:

first means pivotally mounted on said machine and responsive to the closed position of said safety gate to pivot to a first position,

safety bar means mounted on the first platen and responsive to the closed position of said mold halves for supporting the first means in a second position,

second means pivotally mounted and positioned on said safety gate for latching with the first means in the first and the second positions to prevent the opening of the safety gate when the mold halves are in the closed position, and

a rest pin mounted on said first means, said rest pin being supported by said safety bar means to pivot said first means to a third position when the mold halves are open, said first means in the third position allowing the opening of the safety gate.

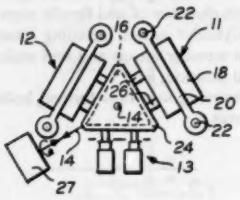
4,162,879
INTERCHANGEABLE ROTATING TABLES FOR INJECTION BLOW MOLDING MACHINES

Alexander G. Makowski, Bound Brook, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed Aug. 26, 1977, Ser. No. 828,186
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—183 10 Claims

1. An injection blow molding machine including in combination a center post means intermittently movable about and along its axis, an indexing plate means secured to the center

post means for movement therewith during successive intermittent movement of the post means both angularly about said axis and axially between raised and lowered positions, a relatively fixed table of the machine at a lower level than the indexing plate means and toward and from which the indexing plate means moves when the center post means moves axially, machine means connected to the table that aligns with openings through the indexing plate means when the indexing plate means is at an angular position at which it moves vertically, a plurality of head means of different size from one another and constructed to support core rods of different size from those on



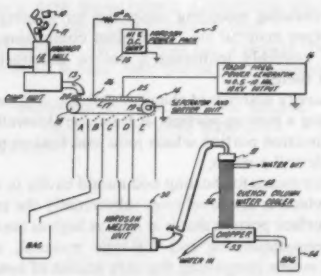
the other head means, all of the head means having openings in bottom faces therefor for register with the openings in the indexing plate means, dowels and sockets in each head means and the indexing plate means in positions to orient any one of the head means with the indexing plate means to register the openings in each head means with corresponding openings in the indexing plate means when any one of the head means is attached to the indexing plate means, and injection, blowing and stripper operational station means at angularly spaced locations around the post means and the indexing plate means and the head means carried by the indexing plate means.

4,162,880

PLASTIC SCRAP RECOVERY APPARATUS

Walter H. Cobbs, Jr., Amherst, and Martin J. Stewart, Strongsville, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 27, 1976, Ser. No. 754,244
Int. Cl.[2] B29B *1/03*
U.S. Cl. 425—202 **16 Claims**



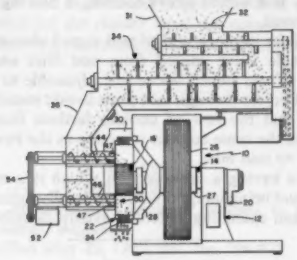
1. A plastic scrap recovery system comprising,
a hopper for receiving articles containing plastic material to be recovered,
breaking means for breaking said articles into chips,
means for separating non-plastic components of said articles from said chips and for sorting heterogeneous mixtures of the chips into batches of discrete homogeneous component plastic materials,
melting means for melting a selected one of said discrete plastic component materials,
pelletizing means for converting said melted plastic component material into solid pellets of said plastic component material, and
means for transporting molten plastic material from said melting means to said pelletizing means.

4,162,881

PELLET MILL WITH IMPROVED FEED SYSTEM

George W. Morse, 9444 S. Wales Way, Elk Grove, Calif. 95624

Filed May 24, 1978, Ser. No. 909,286
Int. Cl.[2] B29C *1/00*; B30B *3/00, 4/28*
U.S. Cl. 425—331 **5 Claims**



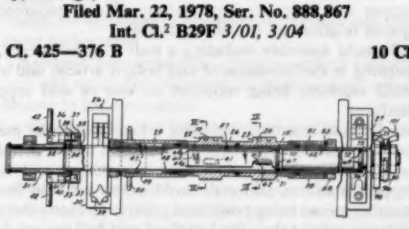
1. A two roller pellet mill comprising means forming a pellet die cavity including a vertical rotatable cylindrical pellet die member first and second rollers mounted side-by-side in said die cavity each having a roller pressing surface closely adjacent to opposing inner surfaces of said die member and forming first and second pressing zones therewith, said die member being divided into first and second hemispheres of rotation along a vertical center line, said first die pressing zone being disposed in the first hemisphere of rotation of said die member from the top of the die member, and said second die pressing zone being disposed in the second hemisphere of rotation from the top of the die member, and means for feeding pelletizable material to said die cavity including first and second conduits with respective first and second outlet openings, said first outlet opening being disposed to deposit said pelletizable material in said first hemisphere of rotation above said first roller of said first die pressing zone, and said second outlet opening being disposed to deposit essentially all of said pelletizable material under said first roller and in said first hemisphere of rotation, whereby pelletizable material falling from said second outlet opening onto the die member in the first hemisphere is spread out uniformly thereon under the influence of gravity and is carried thereon during rotation to the bottom of the rotating die member where it is held against the die member by centrifugal force during rotation to be carried to the second pressing zone.

4,162,882

VALVE MECHANISM FOR SANDWICH CREME

Edward Rose, Skokie, Ill., assignor to Peters Machinery Company, Chicago, Ill.

Filed Mar. 22, 1978, Ser. No. 888,867
Int. Cl.[2] B29F *3/01, 3/04*
U.S. Cl. 425—376 B **10 Claims**



1. In extrusion apparatus for use in applying creme to at least two laterally spaced rows of cookies travelling along a sand-

wiching machine at the same rates of speed, the improvement comprising:

a rotating stencil disposed above said rows of cookies and extending transversely thereof, said stencil having a series of annular ports therein corresponding to the spacing between the centers of said rows of cookies and of an outer diameter corresponding to the amount of creme to be deposited on the cookies,

means rotatably driving said stencil at the speed of travel of the cookies,

a non-rotatable stencil sleeve closely fitting said stencil and having at least two longitudinally spaced aligned ports therein corresponding to the spacing of the ports in said stencil, said stencil sleeve forming a bearing support for said stencil,

a creme inlet into one end of said stencil sleeve,

and a single valve spaced from said inlet and extending axially of said stencil sleeve and adjustable to equalize the flow of creme through said ports in said stencil sleeve and assure that the row of cookies farthest from said inlet receives the same amount of creme as the row of cookies closest to said inlet,

said valve having a cross-section which is a segment of a circle and being integral with a generally cylindrical valve block and extending generally axially therefrom.

4,162,883

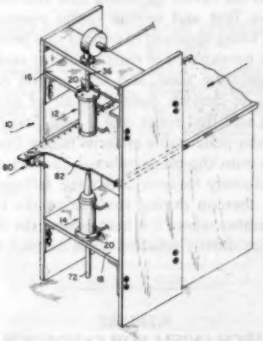
APPARATUS FOR THERMOFORMING HOLLOW ARTICLE HAVING A HIGH L/D RATIO

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 717,636, Aug. 25, 1976, Pat. No. 4,130,387, Ser. No. 583,427, Jun. 3, 1975, Pat. No. 4,085,177, Ser. No. 506,333, Sep. 16, 1974, abandoned, Ser. No. 469,404, May 13, 1974, abandoned, and Ser. No. 448,191, Mar. 5, 1974, abandoned. This application Oct. 14, 1977, Ser. No. 842,254

Int. Cl.[2] B29C *17/04*

U.S. Cl. 425—387.1 **7 Claims**



1. An apparatus for thermoforming a hollow article from a sheet of thermoplastic material which comprises:

an upper and lower support platforms fixedly mounted in spaced relationship to said apparatus;

a male mold assembly including a male member means for assisting in the formation of said hollow article, said male mold assembly being mounted on one of said support platform;

a female mold assembly including a female member means having a leading edge portion and formed with a chamber, said female mold assembly being mounted on said other support platform, said male mold means and said female member means being positioned relative to each other at a distance greater than the length of said hollow article to be formed;

means for supply and passing said sheet of thermoplastic material between said male mold assembly and said female mold assembly;

fluid cylinder means associated with said female mold assembly for extending said female member means to cause said leading edge of said female member means to contact a selected portion of said sheet of thermoplastic material and thereafter to cause said leading edge of said female member means to pass through the plane of said sheet of thermoplastic material;

fluid cylinder means associated with said male mold assembly for extending said male member means through said selected portion of said sheet of thermoplastic means defined by said leading edge of said female member means and into said chamber of said female member means, each said fluid cylinder means including means for returning said female member means and said male member means to an initial position; and

means for removing said thus formed hollow article from said apparatus.

4,162,884

APPARATUS FOR SHAPING PLASTICS FOILS

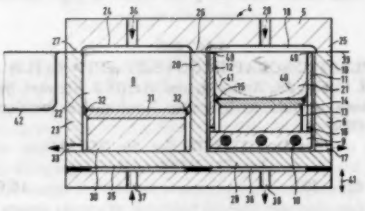
Arthur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,103

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2638759

Int. Cl.[2] B29C *17/04*

U.S. Cl. 425—388 **11 Claims**



1. Deep drawing moulding apparatus for shaping thermoplastic foil-type material into a container comprising:

a mould assembly including a hollow chamber portion formed therein,

a mould cavity within said chamber defining an inner surface including a bottom portion, at least one sidewall portion, and a junction portion which joins said bottom portion to said sidewall portion;

heat source means for heating said mould cavity to a temperature which is at a level over substantially the entire said inner surface portion that is at least as high as the deformation temperature of said foil-type material, said heat source means comprising the only source of heat for said foil-type material which is heated to a temperature at least as high as said deformation temperature;

means for positioning at the opening of said mould cavity a portion of said thermoplastic material at a temperature below its deformation temperature,

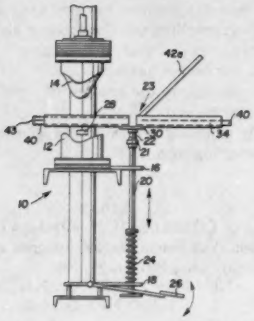
means extending through said junction portion for providing suction to progressively draw said foil into contact with said sidewall portion and also with said bottom portion before contacting said junction portion to provide continuous progressive heating and deformation of said foil-type material as said material progressively contacts the inner surface of said mould cavity.

4,162,885

APPARATUS FOR HOT MOLDING OF MATERIAL

John R. Asel, Lorraine, Canada, assignor to Canadian Lady-Canadelle Inc., Montreal, Canada

Filed Nov. 7, 1977, Ser. No. 849,368
Int. Cl.[2] B29C 17/03
U.S. Cl. 425—400 6 Claims



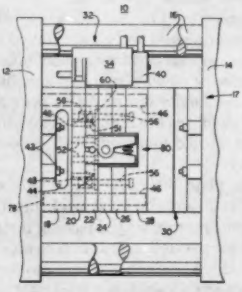
1. Holding means for holding material during forming by a die, comprising two substantially flat parts each with a pair of apertures which are hinged together so as to be movable from a closed condition in which the apertures are in register so forming a common pair of apertures and in which a piece of material may be held between said parts to extend across said common aperture, to an open position in which material may be loaded and unloaded into and out of the holding means, and wherein one of said hinged parts has spring biased movable mountings carrying pins which are surrounded by the substantially flat area of the respective part and project towards the other of said hinged parts so that in the closed position the pins penetrate and hold material which is held substantially flat between said parts, said pins being spaced apart around each of said apertures and being movable towards their respective aperture of the one part against a spring resistance at least some of said pins being located between said apertures and being movable away from each other as they move toward their respective apertures.

4,162,886

DEVICE FOR REMOVING A RUNNER FROM A MULTIPLE PLATE DIE

Maeford J. Holland, 845 Weslyan Dr., Fairfield, Ohio 45014, and Robert B. Raines, 3490 Sodom Rd., Hamersville, Ohio 45130

Filed Mar. 13, 1978, Ser. No. 885,954
Int. Cl.[2] B29C 1/00; B29F 1/14
U.S. Cl. 425—556 10 Claims



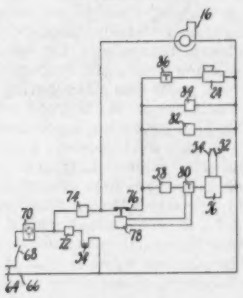
1. The combination of a molding machine which includes a pair of die plates having faces which engage face-to-face, there being a runner groove in one of said faces and means for advancing at least one of said plates toward and away from the other of said plates between open and closed positions, there being a mold cavity in communication with the runner groove and means for injecting molding material along the runner groove into the mold cavity, a runner forming in the runner groove during injection, with a device for removing the runner from the runner groove which comprises a runner carrier member having a head portion which extends into the runner groove so that a portion of the runner forms around the head portion, means for moving the runner carrier member laterally away from said one of the faces when the plates are in open position to separate the runner from the runner groove, and means for removing the runner from the head portion.

4,162,887

OIL BURNER

David Gray, Bournemouth, England, assignor to Greenmace Limited, London, England

Filed May 23, 1977, Ser. No. 799,327
Int. Cl.[2] F23N 5/00
U.S. Cl. 431—28 4 Claims

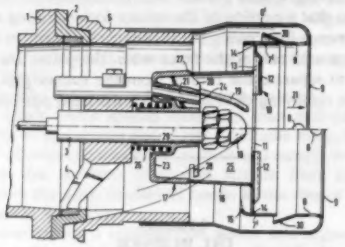


1. An oil burner comprising:
(a) an oil/air jet nozzle having a central oil orifice and an outer air orifice, and having a conduit thereabout;
(b) a chamber for combustion oil;
(c) means for preheating oil in said chamber;
(d) an oil control valve;
(e) means connecting said chamber through said oil control valve to said central oil orifice;
(f) an air pressure responsive switch;
(g) an air control valve;
(h) means for supplying air under pressure through said air pressure responsive switch and said air control valve to said outer orifice, for atomizing oil through said central orifice;
(i) means for supplying combustion air through said conduit about said nozzle;
(j) a discontinuous electrically-operated ignition means adjacent said nozzle for providing an ignition spark when it is desired to initiate ignition;
(k) means for detecting the absence of ignition; and
(l) control means operated by said detecting means and said pressure responsive switch for closing said oil control valve and air control valve on detection of loss of air pressure, for actuating said ignition means on detection of absence of ignition, and for closing said oil control valve and air control valves on failure of said ignition means to ignite the oil/air mixture from said nozzle.

4,162,888
BURNER FOR LIQUID FUELS

Siegfried Weishaupt, and Hermann Kopp, Biberacherstr. 54, both of D-7959 Schwendi, Wurtt., Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,664
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712564
Int. Cl.[2] F23Q *3/00*; F23C *5/06*
U.S. Cl. 431—265 4 Claims

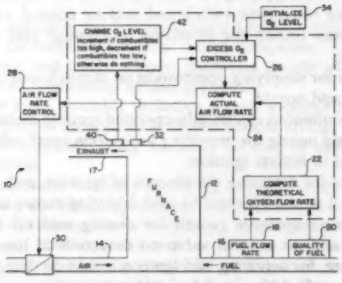


1. A burner for liquid fuel comprising: an air supply pipe with discharge opening; at least one pressure atomizer jet having a discharge opening and located concentrically in said air supply pipe; a combustion chamber; a pot-shaped means located between the discharge opening of said air supply pipe and the discharge opening of said jet and being open towards said combustion chamber; said pot-shaped means having a shell with radial openings and extending to the discharge opening of said air supply pipe and closing said discharge opening of said air supply pipe; said pot-shaped means having a bottom forming a baffle plate with a center opening and radial slots extending therefrom; ignition electrodes; a pot-shaped member upstream of said baffle plate and enclosing a space containing said atomizer jet and said ignition electrodes; pipe means; said pot-shaped member having bottom means penetrated by said pipe means, said pipe means having a discharge opening located upstream of and between said ignition electrodes; said pot-shaped member having a rim diameter substantially smaller than the diameter measured by outer ends of said radial slots and larger than a diameter of said center opening of said baffle plate.

4,162,889
METHOD AND APPARATUS FOR CONTROL OF EFFICIENCY OF COMBUSTION IN A FURNACE

Michael S. Shigemura, Cupertino, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 750,391, Dec. 14, 1976, abandoned. This application May 8, 1978, Ser. No. 903,942
Int. Cl.[2] F23N *5/18*
U.S. Cl. 431—76 6 Claims



1. A system to control the efficiency of combustion of fuel in a furnace, said furnace having a fuel input, an air input, and an exhaust output, and operating near peak efficiency as determined by an excess oxygen level, said system responsive to changes in the flow rate of the fuel or the quality of the fuel to restore the operation of said furnace to near peak efficiency, comprises: A feedforward subsystem having:

means for computing a theoretical oxygen flow rate needed to combust the flow rate and quality of said fuel;

means for calculating an actual air flow rate based upon said theoretical oxygen flow rate and said excess oxygen level;

means for controlling the flow rate of air at the air input, in response to said actual air flow rate;

A feedback subsystem having:

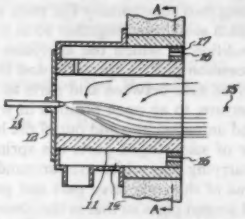
means for detecting the amount of combustibles at the exhaust output; and

means for adjusting the excess oxygen level in response to said detecting means.

4,162,890
COMBUSTION APPARATUS

Yasuo Hirose, Yokohama, Japan, assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed May 2, 1977, Ser. No. 792,978
Int. Cl.[2] F23D *15/00*
U.S. Cl. 431—351 6 Claims



1. A combustion apparatus comprising:

A. a combustion chamber;

B. a tile structure having inner and outer side walls, said inner side wall defining an interior cavity of said tile structure, and an end communicating with said combustion chamber;

C. a disk-shaped cover plate attached to an opposite end of said tile structure;

D. an annular air passage adjacent said outer side wall of said tile structure and connected to a source of air above atmospheric pressure;

E. a burner means extending through said cover plate and positioned so that it directs a stream of fuel at a velocity sufficient to create a Coanda effect axially through said interior cavity to said combustion chamber whereby combustion gases are drawn back through said interior cavity to mix with said stream of fuel;

F. an air stream inlet on one side only and in said tile structure connecting said air passage to said interior cavity and positioned so that combustion air in an amount less than that necessary to burn said fuel stoichiometrically enters said interior cavity in a direction normal to said stream of fuel and stabilizes the position of said stream of fuel along a portion of said inner side wall opposite said air stream inlet; and

G. a baffle plate placed between said annular air supply passage and said combustion chamber, said baffle plate having one or more air jets passing therethrough connecting said air passage to said combustion chamber, at least one of said jets being located on substantially the same side of said tile as said air stream inlet, whereby combustion air is supplied to said combustion chamber at a velocity of not less than about 30 meters per second.

4,162,891

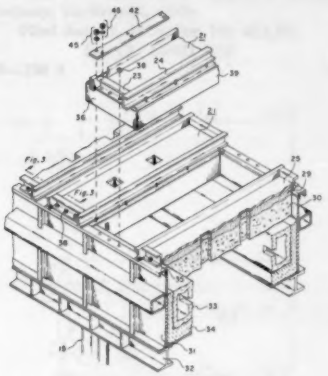
SCRAP PREHEATER MODULAR ROOF ASSEMBLY

John R. Fellnor, Burlington, N.J., and William J. Love, Jr., Perkasie, Pa., assignors to Melting Systems, Incorporated, Burlington, N.J.

Filed Sep. 1, 1977, Ser. No. 829,901
Int. Cl.[2] F27D *1/18*
U.S. Cl. 432—247 6 Claims

1. In a scrap preheating system including a conveyor upon which the scrap to be preheated is positioned, an elongate preheater hood having side walls adjacent the conveyor and a roof assembly including burner means for directing flames upon the scrap, the improvements in the preheater roof assembly permitting ease of repair to the conveyor and preheater hood itself comprising:

a plurality of precast refractory modular roof assemblies of substantially identical configuration positioned in side by side relation transverse to the longitudinal axis of the preheater hood, each modular roof assembly including a roof supporting frame carried by the side walls of the preheater hood and a precast refractory assembly supported by the roof supporting frame and depending from



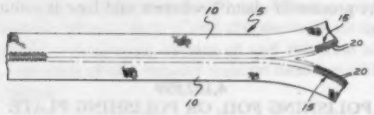
the roof supporting frame in close engagement with the side walls of the preheater hood.

4,162,892

METHOD OF MANUFACTURING CONTINUOUS COIL SLIDE FASTENERS

William R. Wright, Warren; Theodore Murphy, Monson; Kenneth Piazzo, West Warren, and August Leal, Monson, all of Mass., assignors to Wm. E. Wright Co., West Warren, Mass.

Filed Dec. 6, 1977, Ser. No. 858,071
Int. Cl.[2] D06P 3/00, 5/00
U.S. Cl. 8—4 10 Claims



1. Method of manufacturing coil type slide fasteners comprising the steps of forming a pair of slide fastener coils from polyester monofilament material at a moderate temperature to facilitate coil forming, intermeshing said coils and securing the same along adjacent edges of a pair of fabric webs formed of yarn of the same material as the coils, whereby a continuous length of slide fastener chain is formed; continuously moving said chain in tensioned condition while performing the following sequential treatments; applying to said chain a thermosoling liquid dispersion dye in solution with a thickener in a sufficient quantity to promote application of a uniform film of the dispersion dye on said fastener coils; subjecting the material forming said chain for the first time to a temperature in the range of 380°–420° F. which is substantially higher than the coil forming temperature for simultaneously thermosetting said polyester and thermosoling said dispersion dye whereby said dye in its solid phase sublimates and its vapor penetrates the molecular structure of said polyester to effect color fast dyeing of the chain and then washing said chain to remove said thickener.

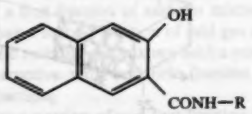
4,162,893

PROCESS FOR DYEING HUMAN HAIR WITH DIAZO SALTS

Arthur Bühler, Rheinfelden; Alfred Fasciati, Bottmingen, and Walter Hungerbühler, Riehen, all of Switzerland, assignors to Henkel Kommanditgesellschaft auf Aktien Henkel K G a A, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,696
Claims priority, application Switzerland, Dec. 27, 1976, 16349/76
Int. Cl.[2] A61K 7/13
U.S. Cl. 8—10.1 7 Claims

1. A process for dyeing human hair with developing dyes which comprises applying to said hair, at temperatures of from about 15° to 40° C., an effective amount for dyeing of aqueous solutions of diazo salts and coupling components successively in any desired sequence, or simultaneously, and coupling said diazo salts and coupling components with each other, wherein the coupling component is a 2-hydroxy-naphthalene-3-carboxylic acid amide of the formula



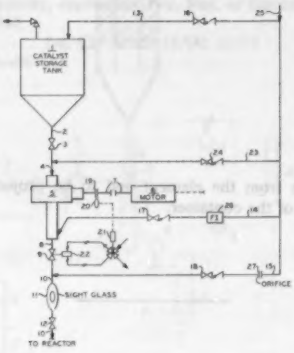
wherein R represents a member selected from the group consisting of an unsubstituted aryl group and a substituted aryl group.

4,162,894

POSITIVE SHUT-OFF FOR CATALYST FEED SYSTEM

William R. Tribble, Pasadena, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 26, 1976, Ser. No. 652,271
Int. Cl.[2] G05D 7/00
U.S. Cl. 23—230 A 4 Claims



4. In a method for controlling catalyst feed to a reactor comprising supplying catalyst through a ball feed valve in response to a control condition in the reactor the improvement in assuring positive shut-off of the catalyst feed comprising:

(a) automatically operating a shut-off valve placed downstream of the feed valve to concurrently open said shut-off valve and said feed valve with closing of the shut-off valve initiated by positioning of the feed valve for discharge of catalyst to the reactor with positive closing of the feed valve and shut-off valve.

4,162,895

MOUSE SERUM

Cesar L. Cambiaso, and Pierre L. Masson, both of Brussels, Belgium, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,537
Claims priority, application United Kingdom, Dec. 10, 1976, 51739/76
Int. Cl.[2] G01N 33/16, 31/14
U.S. Cl. 435—7 B 25 Claims

1. A method of analysing a liquid for the presence therein of Ab, Ag or Ab:Ag, which includes the step of adding to the liquid, before or after adding other reagents, the active fraction of whole mouse serum, to bind with Ab:Ag present in or generated in the sample.

4,162,896

MICRO-ANALYSIS PROCESS AND DEVICE

Peter Hosli, Paris, France, assignor to Institut Pasteur, Paris, France

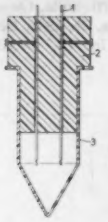
Filed Feb. 27, 1978, Ser. No. 881,354
Claims priority, application France, Mar. 9, 1977, 77 07016
Int. Cl.[2] B01L 3/00; G01N 1/10
U.S. Cl. 23—230 R 28 Claims

9. A micro-analysis process comprising the steps of:

(a) taking up at least one reagent used during the analysis by means of at least one taking up-measuring out element operating by surface tension;

(b) positioning said at least one element inside a container; and

(c) subjecting the element and container assembly to centrifugation of a sufficient intensity for the reagent taken to



separate from the element and to be projected to the bottom of the container.

4,162,897

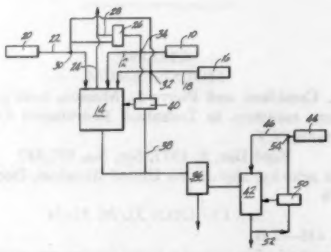
METHOD OF MEASURING NITROGEN TRICHLORIDE IN A PROCESS FOR THE SAFE PRODUCTION OF POLYCHLOROISOCYANURATES

Italo A. Capuano, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 744,489, Nov. 24, 1976, Pat. No. 4,087,607. This application Sep. 20, 1977, Ser. No. 834,939

Int. Cl.[2] G01N *31/08*

U.S. Cl. 23—232 C **4 Claims**



1. A method of analyzing effluent gases from a polychloroisocyanurate product for nitrogen trichloride which comprises:

(a) introducing said effluent gases into a first zone,

(b) introducing a carrier gas into said first zone to form a gaseous mixture,

(c) passing said gaseous mixture from said first zone through a chromatographic column to separate said nitrogen trichloride from said gaseous mixture,

(d) passing said nitrogen trichloride from said chromatographic column to a detector to measure the concentration of said nitrogen trichloride from said chromatographic column,

(e) recording said concentration of nitrogen trichloride on a recording device,

(f) providing said recording device with an upper limit for the concentration of nitrogen trichloride in said effluent gases, and

(g) activating an alarm when said upper limit of said concentration is reached or exceeded.

4,162,898

PROCESS FOR REMOVING SULFUR FROM COAL

Donald B. Anthony, Aurora, and Allan V. Marse, Independence, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 31, 1978, Ser. No. 891,962

Int. Cl.[2] C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 R **8 Claims**

1. A process for removing sulfur from coal comprising contacting the coal with a leachant comprising an aqueous solution containing sodium nitrate, sodium nitrite and a base.

2. The process of claim 1 wherein said base is sodium hydroxide.

4,162,899

POLISHING FOIL OR POLISHING PLATE

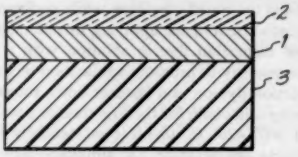
Sandor Molnar, Neuhausen, and Wolfhart Rieger, Buch, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,561

Claims priority, application Switzerland, Sep. 8, 1976, 11380/76

Int. Cl.[2] B24D *11/02*

U.S. Cl. 51—295 **9 Claims**



1. A polishing foil or polishing plate which is used together with a polishing substance for preparing the surfaces of materials, in particular for polishing metallographic, petrographic and ceramographic samples which comprises a first layer of a metallic base having a polishing surface provided with a second non-metallic layer selected from the group consisting of an inorganic oxide, inorganic phosphate, inorganic chromate, inorganic molybdate and inorganic oxalate layers which covers the polishing surface, acts as a polishing substrate and is intimately and directly bonded to the said metallic base without the presence of an intermediate layer therebetween.

4,162,900

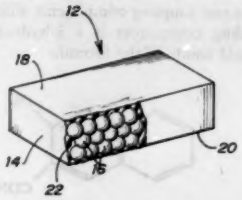
COMPOSITION HAVING IMPROVED WEAR RESISTANT AND COMPRESSION RESILIENT PROPERTIES

Oliver S. Judd, Arlington, Tex., assignor to The Hutson Corporation, Arlington, Tex.

Filed Sep. 13, 1976, Ser. No. 722,813

Int. Cl.[2] B24D *3/32*

U.S. Cl. 51—295 **10 Claims**



1. A composition having improved wear resistant and compression resilient properties which is particularly suited for use

as a liner for an industrial vibratory finishing machine to reduce abrasion damage, comprising:

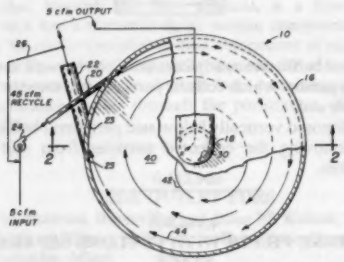
a compressible elastomeric substrate having a working surface subject to abrasion, and a non-working surface not subject to abrasion in spaced relationship with the working surface; and

a plurality of separate abrasive resistant members of predetermined solid geometric configurations comprising particles and randomly arranged between the surfaces of said substrate with at least certain of said abrasive resistant members having surfaces positioned closely adjacent to the working surface, and with an effective amount of substrate between each of said abrasive resistant members and the non-working surface of said substrate to allow compression of said abrasive resistant members within said substrate.

4,162,901
VORTEX GAS SEPARATOR

David N. Enegess, Broad Brook, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Apr. 28, 1975, Ser. No. 572,253
Int. Cl.² B01D *53/04*
U.S. Cl. 55—17 **23 Claims**



1. An apparatus for effecting the separation of a gas mixture into at least a first fraction and a second fraction, wherein said apparatus comprising:

a. a non-rotating cylindrical container having a first disc at one end and a second disc at the other end connected by a cylindrical side wall and wherein said first and second discs are substantially parallel;

b. a first fluid outlet as the central axis of said cylindrical container;

c. a second fluid outlet at the periphery of said cylindrical container;

d. means for injecting said gas mixture into said cylindrical container, said means inducing a gas vortex within said cylindrical container; and

e. a substance suspended on the interior of said cylindrical container, said substance being more interactive with said first fraction of said gas mixture than with said second fraction of said gas mixture.

23. A method for separating a gas mixture into at least a first fraction and a second fraction, wherein said method comprising the steps of:

(a) swirling said gas mixture in a vortex;

(b) causing a first fraction of said gas mixture to lose more energy than a second fraction of said gas mixture by contacting said swirling gas mixture with a substance which is more interactive with said first fraction than with said second fraction;

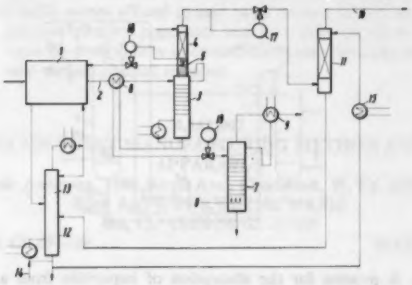
(c) removing a portion of said first fraction from the center of said vortex; and

(d) removing a portion of said second fraction of said gas mixture from the periphery of said vortex.

4,162,902
REMOVING PHENOLS FROM WASTE WATER

Paul Wiesner, Oberursel, and Hans-Martin Stonner, Schwalbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 693,040, Jun. 4, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,429
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2527983
Int. Cl.² B01D *19/00, 53/14*
U.S. Cl. 55—54 **1 Claim**



1. A process for removing phenols as well as the volatile compounds NH_3, CO_2 and H_2S from waste water resulting from gasification or degasification of coal by means of liquid/-liquid countercurrent extraction of the phenols with isopropylether thereby achieving a phenol laden solvent layer and a dephenolized aqueous layer, by an organic solvent, followed by two consecutive distillation steps for separate recovery of acid gases CO_2 and H_2S, solvent and ammonia with a low acid gas content, comprising:

(a) Extracting the waste water in countercurrent with a low-boiling organic solvent, thereby achieving a phenol laden solvent layer and a dephenolized aqueous layer, and separating the layers;

(b) stripping off from the aqueous layer under superatmospheric pressure as vapors CO_2, H_2S, small amounts of NH_3 and the organic solvent contained therein;

(c) condensing the vapors of step (b) by washing them under pressure with from 5 to 20% by weight of the cold dephenolized aqueous layer from step (a) thereby to remove the NH_3 as well as most of the organic solvent, thus achieving an aqueous/organic mixture with an organic solvent content exceeding the physical solubility of the organic solvent in water, settling the excess solvent by gravity as an organic layer which is drawn off from the aqueous layer which is returned to step (b);

(d) scrubbing the acidic vapors from step (c) with cold circulating phenol from step (f) to recover the last traces of solvent and NH_3 to receive a CO_2 and H_2S acid gas freed of solvent and NH_3;

(e) stripping the bottom product of step (b) with live steam under atmospheric pressure, thereby achieving as overhead vapors a concentrated NH_3-vapor with only small amounts of CO_2 and H_2S, which can be either burned or condensed, and as a bottom product a treated waste water suitable for biological treatment;

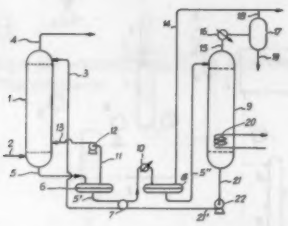
(f) distilling the solvent layer from step (a) in a distillation column thereby achieving as overhead product a pure solvent which is condensed and recycled to step (a) and as bottom product a phenol which is partly used for scrubbing of the acidic vapors in step (d) and partly discharged as crude phenol.

4,162,903

PHYSICAL SOLVENT ABSORPTION OF CARBON DIOXIDE AND HYDROGEN SULPHIDE FOR THE DEACIDIFICATION OF INDUSTRIAL GASEOUS MIXTURES

Claude Blanc; Jean-Yves Chenard, both of Pau; Jean-Jacques Delpuech, Laxou, and Olivier Oliveau, Lescar, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Mar. 8, 1978, Ser. No. 884,211
Claims priority, application France, Mar. 9, 1977, 77 06953
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—73 **5 Claims**



1. A process for the absorption of impurities from a gas mixture that contains at least one impurity selected from the group consisting of H_2S, CO_2, COS, CS_2, mercaptans, sulfides and disulfides, each having a partial pressure of at least one bar, said process consisting in contacting the gas mixture with a solvent, pure or mixed with water, in an absorption zone maintained at a total pressure higher than atmospheric pressure and at a temperature between 10° and 80° C., said solvent having the formula:

wherein R_1, R_2, and R_3 are C_1 to C_4 alkyl radicals, said solvent being liquid at a temperature above 40° C., exhibiting at 40° C. a CO_2 absorption capacity of at least 0.5% by weight per bar of partial pressure of this component, a methane capacity of less than 0.015% by weight per bar of partial pressure of this component and a vapor pressure less than 0.5 Torrs at 40° C., and removing from said absorption zone said solvent having absorbed therein H_2S and/or CO_2.

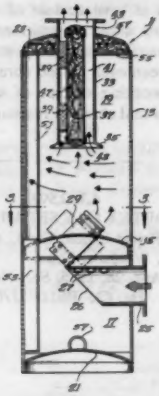
4,162,904

SILENCER-SEPARATOR DEVICE

Paul E. Clay, and James K. Floyd, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 10, 1978, Ser. No. 895,146
Int. Cl.[2] B01D *50/00*; F01N *3/02*
U.S. Cl. 55—276 **10 Claims**

1. A silencer-separator device comprising:
a generally cylindrical casing which is generally circular in cross section;
means intermediate the ends of said casing dividing it into an upper separator chamber and a lower expansion chamber;
means closing the bottom of said expansion chamber;
an inlet pipe communicating with said expansion chamber for directing a gas stream thereinto;
at least two flow tubes defining at least two passages through said dividing means, said flow tube means being disposed at an angle between about 30° and about 60° to the vertical and being located to direct the gas upward into said separator chamber with a swirling movement along the interior wall surface of said casing;
means closing the upper end of said separator chamber;
central outlet means which extends downward through said upper closure means and which is located generally along the axis of said casing, said outlet means being generally tubular in shape and having an entrance located a substantial vertical distance below said upper closure means;



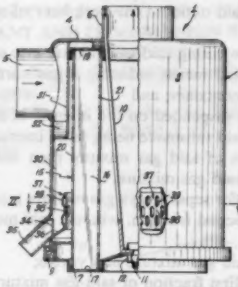
peripheral baffle means adjacent said interior wall surface of said separator which collects particles entrained in the gas stream; and,
means disposed vertically below said peripheral baffle means for removing the collected particles from said upper chamber.

4,162,905

AIR INTAKE FILTER WITH CYCLONE SEPARATOR STAGE

Gustav Schuler, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,337
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 7638324[U]
Int. Cl.[2] B01D *45/16, 45/06*
U.S. Cl. 55—337 **3 Claims**



1. A filter assembly designed to serve as an air intake filter for a combustion engine, compressor, or other air-aspirating machine, the filter assembly comprising in combination:
an enclosed round filter housing defining a longitudinal axis for the filter assembly, one axial side of the housing being accessible through a removable cover;
a hollow-cylindrical filter element extending axially inside

the filter housing and thereby subdividing the enclosed housing space into a clean air space inside the filter element and an annular raw air space between the filter element and the housing;

an air inlet communicating with the raw air space of the housing, and an air outlet communicating with the clean air space of the housing;

a dust-collecting sash arranged in the raw air space, near an axial extremity thereof;

first air deflecting means arranged inside the raw air space of the housing for imparting to the incoming flow of raw air a helical swirl which is directed towards the dust collecting sash, the raw air space thereby serving as a separation chamber, while a cyclone-type air precleaning action takes place in said chamber, heavier particulate matter entrained by the air being projected against the dust-collecting sash in the separation chamber;

a dust discharge port arranged near the dust-collecting sash of the separation chamber;

a perforated baffle collar concentrically surrounding the filter element with a flow gap therebetween and extending axially from the dust-collecting sash of the separation chamber a distance into said chamber, the perforation of said baffle collar thereby serving as a second air deflecting means

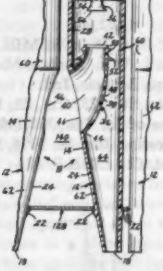
for guiding a portion of the helically swirling raw air inwardly from the separation chamber, through the baffle collar, towards the filter element, in a flow direction which has a circumferential motion component opposed to the circumferential motion component of said helically swirling raw air, said deflection in the circumferential sense preventing the air flow from entraining the heavier particulate matter through the perforation of the baffle collar.

4,162,906

SIDE OUTLET TUBE

Bruce M. Sullivan, Burnsville, and Allen M. Kaluza, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed May 5, 1977, Ser. No. 794,045
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—346 **12 Claims**



1. A side outlet cyclone separator tube through which contaminant-laden air flows, comprising:

(a) a first conduit member having a continuous side wall and an inner surface defining a generally axial passageway between inlet and outlet ends thereof, said continuous side wall having an aperture disposed intermediate said inlet and outlet;

(b) a second conduit member having a continuous side wall and inner and outer surfaces defining a passageway between an inlet end disposed within said axial passageway proximate said inlet end of said first conduit member and an outlet end terminating at said aperture, said second conduit member having a curved central axis with the inside diameter thereof measured along planes normal to said central axis gradually increasing from said inlet end of said second conduit member to said outlet aperture;

(c) vortex generating means affixed to said first conduit member within said axial passageway at said inlet end thereof whereby a circular flow component is imparted to the axial flow of aid contaminant-laden air such that contaminants are centrifugally blown toward said inner surface of said first conduit member to exit through said outlet end thereof, while clean air is channeled through said second conduit member to discharge through said aperture in said side wall of said first conduit member; and

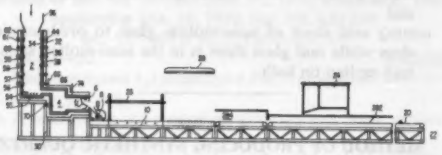
(d) baffle means affixed to said outer surface of said second conduit member proximate said inlet end thereof to prevent the reverse flow of contaminants into said inlet end of said second conduit member.

4,162,907

GLASS SHEET MANUFACTURING METHOD AND APPARATUS

Frank Anderson, 1105 Beech Ave., Charleston, W. Va. 25302

Filed Apr. 7, 1978, Ser. No. 894,510
Int. Cl.[2] C03B *18/02, 21/02*
U.S. Cl. 65—29 **56 Claims**



1. An automated all-electric glass manufacturing apparatus comprising:

vertical air-cooled furnace means for melting raw materials into molten glass, said furnace means having a top, a base, and a throat opening at said base of said furnace means;

transverse air-cooled refiner means coupled to said furnace throat opening for receiving said molten glass from said furnace means, and for maintaining said molten glass in a homogenous molten stage, said refiner means having a plurality of molten glass exit openings;

refiner glass level maintaining means for controlling the molten glass intake of said refiner means from said furnace throat openings;

molten glass metering means for forming a glass charge of a predetermined volume of molten glass, and for delivering said molten glass charge from said molten glass exit openings of said refiner means; and,

molten glass extruding means for receiving said glass charge from said metering means and for forming said charge into a sheet of semi-molten glass of predetermined thickness, said extruding means comprising a pair of rollers and means to apply controlled pressure to said glass charge to feed said charge through said rollers.

34. A molten tin bath for imparting an ideal smoothness to a sheet of semi-molten glass deposited on said tin bath, said tin bath comprising:

a molten tin bath container having rectangular bottom, front, back and side steel plated faces and an open top face;

molten tin within said molten tin bath container;

electrode means traversing the interior of said container for maintaining said molten tin in the molten state;

an external flat flange seated horizontally on said front, back and side steel plated faces around the perimeter of said open top face, said external flange overlapping said front, back and side faces and having a plurality of recessed indentations proportionately spaced in said external flange;

scrap glass rejection means for removing scrap glass from said flat flange, said glass rejection means comprising a rotating bar, a plurality of rejection forks rigidly attached to said rotating bar, said rejection forks horizontally seated in said recessed indentations of said external flange when said rotating bar is rotated in a first direction, and said rejection forks rotated to a substantially vertical position when said rotating bar is rotated in a second direction opposite to said first direction;

whereby scrap glass lying on said external flange is removed from said molten tin bath as a result of the horizontal to vertical rotation of said rejection forks.

42. A method for the automated manufacturing of sheet glass comprising the steps of:

melting raw glass batch materials in a vertical furnace;

maintaining molten glass in a homogenous state in a transverse refiner;

cooling the walls of said furnace and said refiner;

maintaining a constant predetermined refiner molten glass level within said refiner;

forming a discrete molten glass charge of a predetermined volume of molten glass and delivering said glass charge from said refiner; and

extruding said glass charge into a sheet of semi-molten glass of a predetermined thickness over a molten tin bath.

56. A method for the automated manufacture of sheet glass comprising the steps of:

forming a sheet of semi-molten glass on a molten tin bath; and

cutting said sheet of semi-molten glass to predetermined sizes while said glass sheet is in the semi-molten state on said molten tin bath.

4,162,908

METHOD OF PRODUCING SYNTHETIC QUARTZ GLASS, APPARATUS FOR THE PRACTICE OF THE METHOD, AND USE OF THE SYNTHETIC QUARTZ GLASS

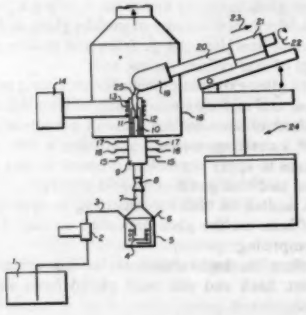
Karlheinz Rau, Hanau; Fritz Simmat, Gelnhausen; Albert Muhlich, Frankfurt, and Norbert Treber, Kriftel, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 713,541, Aug. 11, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,965

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536457

Int. Cl.[2] C03C *17/00, 17/02, 25/02*

U.S. Cl. 65—60 D **12 Claims**



1. A method for forming a coating of a fluorine containing synthetic OH ion-free quartz glass on a refractory support which comprises passing a hydrogen-free silicon compound, gaseous oxygen and vaporous CCl_2F_2, $CClF_3$ or CF_4 in a hydrogen free gas stream through an induction coupled plasma burner whereby said hydrogen-free silicon compound reacts with said oxygen to form synthetic OH ion-free quartz glass, the amount of said CCl_2F_2, $CClF_3$ or CF_4, passed through said burner, being sufficient to yield a fluorine content in the quartz glass in an amount of at least 500 grams per kg of quartz to be produced whereby there is formed a fluorine-doped synthetic OH ion-free quartz glass and depositing said fluorine-doped synthetic OH ion-free quartz glass as a coating on a refractory support.

4,162,909

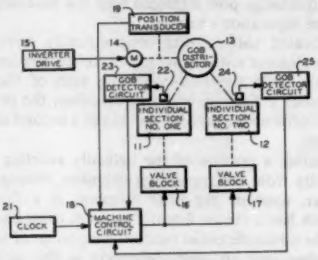
HOT GOB DETECTOR FOR CONTROLLING A GLASSWARE FORMING MACHINE

Homer D. F. Peters, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 1, 1977, Ser. No. 856,473

Int. Cl.[2] C03B *9/40*

U.S. Cl. 65—163 **15 Claims**



1. In a glassware forming machine including means for distributing gobs of molten glass at a predetermined rate from a source of the gobs; means for forming glassware articles in a timed, predetermined sequence of steps from the gobs received from the distributing means; means for generating timing signals; and control means responsive to the timing signals for cyclically controlling the actuation of the forming means in cycles of the timed, predetermined sequence of steps, the improvement comprising: a gob detection means responsive to the presence of a gob proximate the forming means for generating a time reference signal to the control means and wherein the control means includes means responsive to said time reference signal for adjusting the starting time of the subsequent forming cycle of the timed, predetermined sequence of steps.

4,162,910

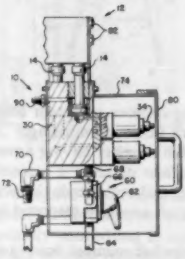
VALVE BLOCK ASSEMBLY

Kurt Lining, and Charles L. Wood, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 516,223, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 208,199, Dec. 15, 1971, abandoned. This application Jan. 28, 1976, Ser. No. 653,059

Int. Cl.[2] C03B *9/40*

U.S. Cl. 65—163 **5 Claims**



1. In a glass forming machine which performs, in sequence,

a plurality of steps to produce glass articles, an improved means for controlling the operational sequence of a plurality of movable components in said machine by controlling the pressure of an operational fluid at each of a plurality of component actuating means, said controlling means comprising:

a source of pressurized gas,

a valve block having a plurality of cavities therein,

a piston positioned in each cavity, each piston being selectively movable with respect to its associated cavity to an extended position,

a plurality of solenoid operated valve means, said valve means each controllably coupling said pressurized air to one of said cavities to thereby move said piston in said cavity to said extended position,

means for generating electrical signals for energizing said solenoid operated valve means at predetermined intervals to thereby control the movement of said pistons in said cavities in a preselected manner, and

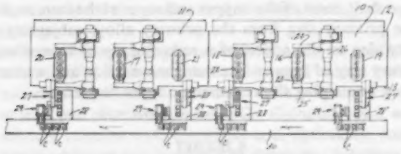
a plurality of mechanically operated pneumatic valves, each of said valves controlling the flow of fluid under pressure to thereby control said glass forming machine, each pneumatic valve having an operating rod extending therefrom which controls the operation of its associated valve when moved, said operating rods being aligned and engaged with a corresponding one of said pistons, each operating rod being moved by the movement of a corresponding piston to its extended position to thereby initiate a step in the operation of said glass forming machine.

4,162,911

PLURAL GLASS FORMING MACHINES WITH LEHR CONVEYOR

James D. Mallory, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 14, 1977, Ser. No. 815,626
Int. Cl.[2] C03B *9/00, 19/02;* B25J *3/00*
U.S. Cl. 65—229 **1 Claim**



1. An array of a plurality of glass container forming machine sections in which each forming machine section comprises a split parison molding unit, a split blow molding unit, said parison molding unit having a plurality of mold cavities therein, said blow molding unit having a plurality of mold cavities therein and being laterally displaced from said parison molding unit, the axes of the parison cavities being in spaced aligned relation and lying in a first plane, the axes of the blow mold cavities being in similarly spaced aligned relation and lying in a second plane parallel to said first plane, means for simultaneously transferring parisons from the parison forming unit to the blow molding unit, said transfer means being pivotally mounted on said apparatus about an axis disposed in right angular relation to an in a plane parallel to the axes of said cavities, a second blow molding unit having a plurality of mold cavities having their axes in spaced aligned relation similarly to that of said parison cavities and lying in a third plane parallel to said first plane on that side of said parison mold opposite said first mentioned blow molding unit, and a second transfer means pivotally mounted about an axis disposed in right angular relation to and in a plane parallel to the axes of said parison cavities, said parisons being moved through parallel arcs from inverted position at the parison forming station to an upright position at the blow molding stations whereby said parisons are subjected to the same centrifugal and gravitational forces during transfer; the improvement comprising one plural cavity container forming machine in juxtaposition to another such that the adjacent plural cavity blow molding units of the separate sections are in planes that are parallel to each other and to the pivot axis of the parison transfer means and the spacing between all of the molding units, both parison molding units and blow molding units are equal, a machine conveyor extending past the array of forming machines with its longitudinal axis being normal to the planes of the split lines of all the molding units in the array of machines.

4,162,912

COMPOSITION AND PROCESS FOR CONTROLLING MILKWEED VINE

Raghavan Charudattan, 8520 NW. 2nd Pl., Gainesville, Fla. 32601, assignor to Raghavan Charudattan, Gainesville, Fla.

Filed Feb. 7, 1978, Ser. No. 875,846
Int. Cl.[2] A01N *9/00*
U.S. Cl. 71—79 **5 Claims**

1. A biological herbicide composition for the control of milkweed vine said composition comprising: *Araujia mosaic* virus and an agronomically acceptable carrier.

4,162,913

1,2-DIMETHYL-3,5-DIPHENYLPYRAZOLIUM-2,2-DICHLOROPROPIONATE

Richard W. Feeny, Hightstown, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 307,689, Nov. 17, 1972, abandoned. This application Oct. 14, 1975, Ser. No. 622,299
Int. Cl.[2] A01N *9/22;* C07D *231/10*
U.S. Cl. 71—92 **2 Claims**

1. The compound 1,2-dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate.

2. A method for the control of wild oats and other undesirable grasses comprising:

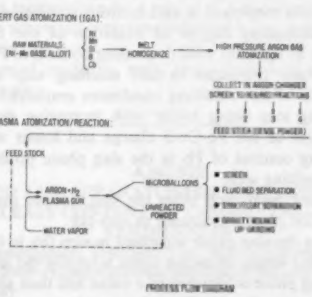
applying to the foliage of the undesirable plant species a herbicidally effective amount of the compound 1,2-dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate.

4,162,914

PROCESSES FOR MAKING HOLLOW METAL MICROBALLOONS AND THE PRODUCTS THEREOF

George D. Cremer, Lemon Grove, Calif., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 4, 1977, Ser. No. 839,351
Int. Cl.[2] B22F *9/00*
U.S. Cl. 75—0.5 B **21 Claims**



1. A method of forming hollow, metallic microballoons having high surface integrity which comprises the steps of: preparing a finely divided feedstock powder with a specified range of particle sizes from a self-scavenging metallic alloy which exhibits high fluidity and a high liquid film strength and which undergoes a minimal volume change and is favorable to the formation of a smooth surface topography upon solidification; introducing said powder into a plasma arc to melt the particles of said powder; making available in said arc a gas which can diffuse into and inflate the molten particles into

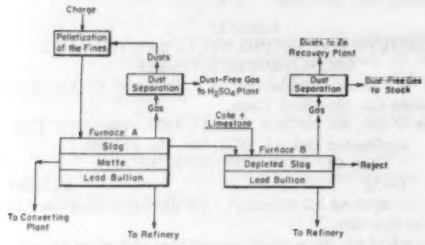
hollow microballoons; and solidifying and collecting said microballoons.

4,162,915

PROCESS FOR TREATING LEAD-COPPER-SULPHUR CHARGES

Robert H. Maes, Hove, and Luc M. Fontainas, Antwerp, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Sep. 1, 1977, Ser. No. 829,780
Claims priority, application Belgium, Sep. 6, 1976, 732
Int. Cl.[2] C22D 7/06
U.S. Cl. 75—14 13 Claims



1. A process for pyrometallurgically treating a Pb-Cu-S charge containing at least one of the elements Fe, Ag, Bi, Zn and Sn, to recover the metal values of said charge, comprising the steps of:

(a) smelting the charge while maintaining chemically reducing, neutral or oxidizing conditions under which said smelting produces

(i) a slag phase containing at least about 10% Pb;

(ii) a copper matte phase containing less than about 65% Cu, the amount of said copper content decreasing with decreasing Cu:S ratio in the Pb-Cu-S charge; and

(iii) a lead bullion phase, the strength of the reducing conditions employed in said smelting step being greater with increasing degree of oxidation of the Pb-Cu-S charge and greater with decreasing content of Pb in the slag phase produced in said smelting step and the strength of the oxidizing conditions employed in said smelting step being lower with increasing degree of oxidation of the Pb-Cu-S charge and lower with decreasing content of Pb in the slag phase produced in said smelting step;

(b) separating from each other the slag, copper matte and lead bullion phases produced in step (a);

(c) reducing the slag phase separated in step (b), in the molten state, with a strong reducing agent whereby the lead content of the slag phase is lowered to a value less than about 2% thereby producing a lead bullion phase; and

(d) separating from each other the slag and lead bullion phases produced in step (c),

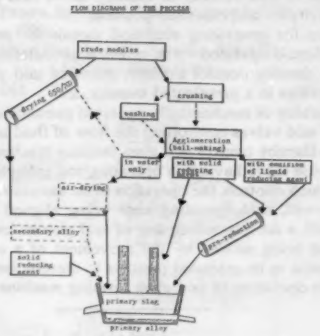
thereby obtaining in step (a) a matte phase which is substantially free of Fe, collecting in step (a) most of the Ag in the matte and bullion phases, most of the Bi in the bullion phase and most of the Fe, Zn and Sn in the slag phase, and obtaining in step (c) a lead bullion which is almost free from Ag and Bi, a slag which is almost free from Zn and Sn and fly ashes containing most of the Zn.

4,162,916

PROCESS FOR THE TREATMENT OF COMPLEX METAL ORES CONTAINING, IN PARTICULAR, MANGANESE AND COPPER, SUCH AS OCEANIC NODULES

Louis Septier; Francis Dubrous, and Michel Demange, all of Le Fayet, France, assignors to Societe Francaise d'Electrometallurgie Sofrem, Paris, France

Filed Mar. 27, 1978, Ser. No. 890,524
Claims priority, application France, Apr. 4, 1977, 77 10862
Int. Cl.[2] C22B 47/00
U.S. Cl. 75—21 12 Claims



1. A process for the pyrometallurgical treatment of complex metal ores, which contains, in addition to manganese and iron, small quantities of nickel, cobalt and copper in amounts up to a total of 4% by weight, comprising treating the ore by fusion in an electric arc furnace in the presence of a reducing agent to produce a primary slag containing manganese, some of the copper and some of the iron and a primary alloy containing nickel, cobalt, most of the copper and some of the iron, separating the primary slag from the primary alloy, subjecting the primary slag to the action of a reducing agent to produce a secondary slag of copper-free manganese oxide and a secondary alloy containing the remaining copper and iron.

4,162,917

METHOD AND COMPOSITION FOR TREATING MOLTEN FERROUS METALS TO PRODUCE NODULAR IRON

Robert D. McWhorter, and Perry C. Jones, both of Birmingham, Ala., assignors to Schuler Industries, Inc., Birmingham, Ala.

Filed Jun. 29, 1978, Ser. No. 920,365
Int. Cl.[2] C21C 7/02
U.S. Cl. 75—130 R 12 Claims

1. In a composition for use in the treatment of molten metals and alloys of the iron group by submerging the composition into molten metal to effect the formation of nodular iron: a compressed bonded mechanical mixture comprising,

(a) particles containing a reactive metal selected from the group consisting of alkali, alkaline earth, rare earth metal and alloys and mixtures thereof,

(b) particles of soluble synthetic graphite,

(c) a binder bonding said particles containing reactive metal and said particles of soluble synthetic graphite together, and

(d) said particles of soluble synthetic graphite being of a size to provide an initial protective refractory material around said particles containing reactive metal to control the release of said reactive metal into the molten metal upon submerging the compressed bonded mechanical mixture into the molten metal whereupon said soluble synthetic graphite is absorbed by the molten metal to cause nucleation of the graphite.

4,162,918

RARE EARTH METAL DOPED DIRECTIONALLY SOLIDIFIED EUTECTIC ALLOY AND SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,779
Int. Cl.[2] B22D *21/06*; C22C *19/00*
U.S. Cl. 75—171 4 Claims

1. A directionally solidifiable eutectic alloy casting material NiTaC-13 having a high resistance to metal-mold interface reaction during casting including less than 3 weight percent of a rare earth metal as a dopant material in its material composition, the rare earth metal is one whose metal cation is in the ceramic material comprising the mold and/or core in contact therewith.

4,162,919

LAMINATES FOR THE MANUFACTURE OF FLEXOGRAPHIC PRINTING PLATES USING BLOCK COPOLYMERS

Peter Richter, Ludwigshafen; August Wigger, Waldsee; Gerhard Fahrbach, Plankstadt; Erhard Seiler, Ludwigshafen, and Helmut Barzynski, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 635,629, Nov. 26, 1975, abandoned. This application Nov. 16, 1977, Ser. No. 851,824
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456439
Int. Cl.[2] G03C *1/78, 1/68, 1/76, 5/00*
U.S. Cl. 96—87 R 8 Claims

1. Laminates for the production of relief printing plates and comprising

(a) a layer RS consisting essentially of a photocrosslinkable mixture of at least one soluble polymer P and at least one monomer M which is compatible with polymer P and has at least one photocrosslinkable C—C double bond, which mixture contains a photoinitiator and, optionally, conventional additives and is soluble in developer solutions used to form the relief in the imagewise-exposed layer RS,

(b) a non-photocrosslinkable elastomeric underlayer U which has a Shore A hardness of from 15 to 70 and is insoluble in said developer solutions,

(c) a non-photocrosslinkable stabilizing layer ST which is insoluble in said developer solutions,

wherein the photocrosslinkable layer RS contains, as polymer P, a soluble two-block copolymer consisting essentially of from 30 to 95% by weight of a diene hydrocarbon having 4 to 5 carbon atoms and from 5 to 70% by weight of a monomer of the formula

$$CH_2=\underset{\displaystyle R'}{\underset{|}{C}}HR\ ,$$

where R is hydrogen or CH_3; R' is phenyl or C_{1-4} alkyl substituted phenyl, which two-block copolymer has a viscosity number (measured on a 0.5% w/w solution in toluene at 25° C.) of 60 to 350 ml/g, or a partially hydrogenated product thereof and which has either a sudden or gradual transition between the diene hydrocarbon block and the

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}HR \text{ block.}$$

4,162,920

LITHOGRAPHIC PLATE FINISHER

Thomas N. Gillich, Berkeley Heights, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 682,327, May 3, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,943
Int. Cl.[2] C09K *3/00*
U.S. Cl. 106—14.5 9 Claims

1. An emulsion-type lithographic plate finisher comprising a solvent phase including a hydrocarbon petroleum solvent solution of an oleophilic solvent-soluble surfactant,

and an aqueous phase including tapioca dextrin, at least one salt which is not severely corrosive to aluminum, and water.

4,162,921

GLASS-CRYSTALLINE MATERIAL AND METHOD OF PRODUCING SAME

Pavel I. Litvinov, Novorogozhskaya ulitsa, 11, korpus 2, kv. 25; Vitaly M. Firsov, 9 Parkovaya ulitsa, 8, kv. 25, and Galina B. Knyazher, ulitsa Klimashkina, 21, kv. 28, all of Moscow, U.S.S.R.

Filed Jan. 5, 1977, Ser. No. 756,988
Int. Cl.[2] C03C *3/22*; C03B *32/00*
U.S. Cl. 106—39.8 8 Claims

1. A glass-crystalline material consisting essentially of silica, in an amount of 31 to 45% by weight, alumina in an amount of 20 to 30% by weight, magnesia in an amount of 5 to 15% by weight, titania in an amount of 15 to 25% by weight and 14 to 17 wt % of the oxides of the rare earth elements selected from group consisting of cerium, lanthanum, praseodyminum and neodymium; having crystalline phases of cordierite, rutile and a compound of perrierite-like structure and having dielectric properties including a dielectric constant, $\epsilon=10$, and a dielectric loss factor tan $\delta=3-5\times10^{-4}$ Hz.

7. A process for the production of the glass-crystalline material for dielectric substrates which comprises the steps of forming a glass melt composed of silica, alumina, magnesia and titania and 14 to 17 wt % of the oxides of the rare earth elements selected from group consisting of cerium, lathanum, praseodymium and neodymium; forming shaped articles of said glass; heating said glass articles to the maximum crystallization temperature for said glass composition at a rate of 60°–300° C. per hour and then holding said articles at said maximum crystallization temperature for a period of 3 to 6 hours to develop dielectric properties including a dielectric constant, $\epsilon=10$, and a dielectric loss factor tan $3-5\times10^{-4}$ at 10^{10} Hz and crystalline phases of cordierite, rutile and a compound of perrierite-like structure.

4,162,922

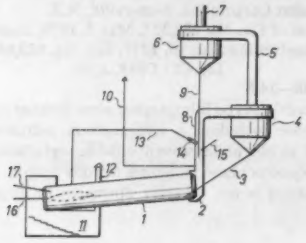
METHOD AND APPARATUS FOR THE LOWERING OF THE ALKALI CONTENT OF CEMENT CALCINED TO COMPLETION

Horst Herchenbach, Troisdorf, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 690,273
Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523367
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—100 3 Claims

1. In the method of lowering the alkali metal content in the calcining to a finish of a pulverized raw material to be used in the manufacture of cement wherein the material is thermally treated in a furnace system in several steps including a preheating step, a separate deacidifying step, and a sintering step in a kiln, the improvements comprising introducing an alkali reduc-

ing chlorine containing additive material during said separate deacidifying step and introducing an additional residual quantity of said alkali reducing chlorine containing additive material in said sintering step.



4,162,923

CALCIUM ALUMINATE BASED REFRACTORY HYDRAULIC BINDER AND ITS PROCESS OF PREPARATION

Jean M. Schmitt, Paris, and Alain Mathieu, Montelimar, both of France, assignors to Lafarge Fondu International, Paris, France

Filed Feb. 9, 1978, Ser. No. 876,553
Claims priority, application France, Dec. 12, 1977, 77 37308
Int. Cl.[2] C04B *7/32*
U.S. Cl. 106—104 **13 Claims**

1. A process of preparing a ground refractory hydraulic binder containing calcium aluminates which comprises:

mixing from 45 to 65% clinker particles containing 45 to 72% CA phase, the balance being almost exclusively constituted by CA_2 phase, 55 to 35% alumina particles, 0.01 to 0.3% sodium citrate and 0.01 to 0.3% of pentasodium tripolyphosphate, the percentages being by weight of the entire mixture wherein the clinker, the alumina or both are ground before or after mixing.

4,162,924

SHAPED BODIES OF CALCIUM SILICATE AND PROCESS FOR PRODUCING SAME

Kazuhiko Kubo; Akira Takahashi, and Kenichi Ohashi, all of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Filed Feb. 11, 1977, Ser. No. 769,402
Claims priority, application Japan, Feb. 13, 1976, 51-15267; Nov. 4, 1976, 51-132850
Int. Cl.[2] C04B *1/00, 7/34*
U.S. Cl. 106—120 **26 Claims**

1. A shaped body of calcium silicate characterized by being composed of globular secondary particles interconnected with one another and each made up of lath-like xonotlite or foshagite crystals having been three-dimensionally interlocked with one another and having an index of crystallite antigrowth of at least 15, the globular secondary particles having had an outside diameter of about 10 to about 80 μm and an apparent density of up to 0.13 g/cm^3 and having been in the form of a shell with a hollow interior space and a thickness of about 0.3 to about 10 μm before being shaped into the body.

4,162,925

PHOSPHATED LOCUST BEAN GUMS

Karl H. O. Tiefenthaler, and Erich W. K. Nittner, both of Kreuzlingen, Switzerland, assignors to Meyhall Chemical AG, Kreuzlingen, Switzerland

Filed May 10, 1978, Ser. No. 904,689
Int. Cl.[2] C08L *5/00*
U.S. Cl. 106—208 **10 Claims**

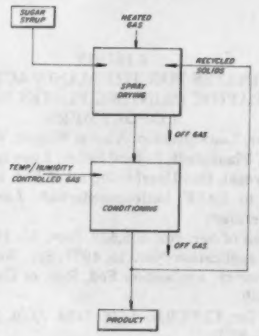
1. A phosphated locust bean gum having a degree of substitution of about 0.03 to about 0.5.

4,162,926

METHOD OF DRYING COMPLEX SUGAR SOLUTIONS

Preston L. Veltman, Severna Park, and John J. Blouin, Catonsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 11, 1978, Ser. No. 868,661
Int. Cl.[2] B01D *1/18;* **C13F** *1/00*
U.S. Cl. 127—62 **3 Claims**



1. A process suitable for drying complex sugar solutions to form stable, solid, particulate product therefrom comprising

(a) drying in a drying zone dispersed complex sugar solutions in a current of heated gas and in the presence of from about 1 to 10 parts by weight of separately introduced recycled conditioned solids per part by weight of solids in solution to produce a solid product; said heated gas has an inlet temperature of from about 100 to 300 degrees C. and an outlet temperature of from about 60 to 120 degrees C;

(b) contacting in a conditioning zone the formed solid product with a conditioning gas having a humidity of less than 50% and having a temperature below the melting point of the formed solid for a time sufficient to reduce the water content of said solids to not greater than 0.5 percent; and

(c) recycling a portion of said conditioned solids to said drying zone to be used as said recycled solids in step (a).

4,162,927

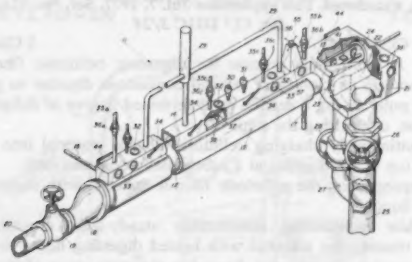
APPARATUS FOR CRYSTALLIZING SUGAR SOLUTION AND MOTHER LIQUORS CONTINUOUSLY BY EVAPORATION

Rafael Morfin-Alvarez, Ingenio Independencia Martinez de la Torre, Veracruz, Mexico

Continuation of Ser. No. 607,730, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 401,465, Sep. 27, 1973, abandoned. This application May 11, 1977, Ser. No. 795,833
Claims priority, application Mexico, Nov. 13, 1972, 139691
Int. Cl.[2] C13F *1/02, 1/12;* **B01D** *9/02*
U.S. Cl. 127—16 **6 Claims**

1. An apparatus for continuously crystallizing sugar by evaporating liquid under vacuum from a highly concentrated mass, comprising a horizontal, elongated, hollow, cylindrical vessel for receiving the mass to be processed, the vessel having a slot extending completely along its upper wall and also hav-

ing a feeding end and a discharge end; a rectangular cover coupled to the vessel and defining a vapor chamber which communicates with the interior of the vessel by way of said slot; a steam heating jacket located around the vessel for heating the interior thereof; means for imparting a helicoidal movement to the mass in process, said means for imparting a helicoidal movement comprising a shaft disposed within the vessel and extending along substantially the entire length thereof, means mounting the shaft within the vessel so as to extend substantially along the central axis thereof and to be rotatable within the vessel about the longitudinal axis of the shaft, drive means connected to the shaft to bring about rotation of the shaft about the longitudinal axis thereof, and a plurality of paddle members secured to the shaft and each having a blade extending substantially radially of the shaft to a position adjacent the interior surface of the vessel; means for adding liquid to the mass in process in order to control the concentration of



the mass, said means for adding liquid comprising a multiplicity of tubes for distribution of liquid coupled to the vessel through the rectangular cover at regularly spaced intervals along the upper portion of the rectangular cover, elbow couplings connected to the distribution tubes, reduction tubes connected to the distribution tubes by the elbow couplings and extending perpendicular to the central axis of the hollow cylindrical body, and sight holes laterally located at regularly spaced intervals along said rectangular cover, in line with said reduction tubes; means located near the discharge end of the vessel for regulating the level to which the vessel is filled by the mass in process, said level regulating means comprising a barrier slidingly coupled to the hollow cylindrical body near its discharging end and means located on said rectangular cover for actuating said barrier; feeding means and feeding control means coupled to the feeding end of the vessel; and discharging means and discharge control means coupled to the discharge end of the vessel.

4,162,928

SOLAR CELL MODULE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Neal F. Shepard, Jr., King of Prussia, Pa.

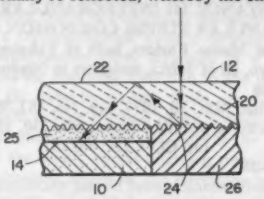
Filed Sep. 29, 1978, Ser. No. 946,994
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC **1 Claim**

1. An improved solar cell module comprising:

A. an internally reflective, transparent cover plate having a pair of opposed surfaces including a substantially smooth planar surface of incidence for accepting incident solar energy, and a uniformly textured surface characterized by a plurality of uniformly configured indentations;

B. a plurality of silicon solar cells adhesively bonded at the active surfaces thereof to mutually spaced portions of said textured surface and defining therebetween interspaces; and

C. means comprising a layer of diffusely reflective material deposited on said textured surface in the interspaces defined between said cells for internally reflecting solar energy to strike said surface of incidence at such angles as to be internally re-reflected, whereby the energy is caused



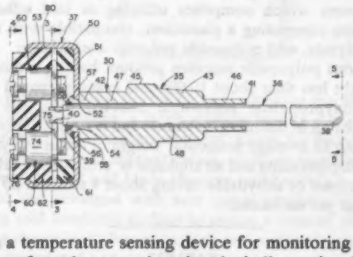
to progress toward the active surfaces of the solar cells of said plurality.

4,162,929

ENGINE MANIFOLD TEMPERATURE SENSING DEVICE

Philip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.

Filed Apr. 5, 1978, Ser. No. 893,761
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—233 **20 Claims**



1. In a temperature sensing device for monitoring the temperature of moving gases in a duct including a sheathed thermocouple sensing element having a junction end and an output end and a pair of leads at the output end and means for supporting the element to mount same in a wall of the duct, the improvement in the means for supporting the element which comprises a mounting stem adapted to be fitted in an opening in the duct wall and to extend both within the duct and outside the duct, and having a central opening therethrough for receiving the element, said element extending within the duct beyond the inner end of the stem a sufficient amount to fully expose the junction end to the flow of gases within the duct and extending slightly beyond the outer end of the stem, a gas seal at the output end of the element to seal between the element and the stem to prevent gas flow therebetween and to secure the element to the stem, said gas seal being a brazed or welded connection between the peripheries of the element and the stem, the fit between the element and the stem being such that a clearance is provided to allow some freedom of movement between the junction end of the thermocouple and the inner end of the stem so that the point of highest stress of the element is at the gas seal and to provide effective damping to the element under vibratory conditions, and terminal means for providing electrical connection to the element leads.

4,162,930

AUSTENITIC STAINLESS STEEL HAVING EXCELLENT RESISTANCE TO INTERGRANULAR AND TRANSGRANULAR STRESS CORROSION CRACKING

Seizaburo Abe; Masao Kozima, both of Yokohama, and Yuzo Hosoi, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Mar. 30, 1977, Ser. No. 782,788
Claims priority, application Japan, Mar. 30, 1976, 51/34188
Int. Cl.[2] C22C 38/48
U.S. Cl. 148—38 2 Claims

1. An austenitic stainless steel having excellent intergranular and transgranular stress corrosion cracking resistance, consisting essentially of not more than 0.02% total carbon, not more than 0.004% of carbon in solid solution, 9 to 18% of nickel, 15 to 22 % of chromium, 0.5 to 2% of manganese, 0.3 to 3.5% of silicon, not more than 0.013% total phosphorus, not more than 0.005% phosphorus in solid solution, not more than 0.006% sulfur, not more than 0.02% nitrogen, not more than 0.01% oxygen, and niobium in an amount corresponding to $15 \leqq Nb/C \leqq 20$, with the balance being iron, and said steel having Nb(P)C or Nb(PC) precipitated in grains, said steel having been subjected to a sensitization treatment.

4,162,931

METHOD EMPLOYING POLYAMIDE THERMOPLASTIC ADHESIVES

Ernest L. Yeakey, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 659,873, Feb. 20, 1976, Pat. No. 4,128,525, which is a continuation-in-part of Ser. No. 528,458, Nov. 29, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,013
Int. Cl.[2] C09J 5/00
U.S. Cl. 156—331 1 Claim

1. In a method of bonding two solid surfaces to each other by means of a bonding layer of a thermoplastic adhesive, the improvement which comprises utilizing as said adhesive a formulation comprising a plasticizer, compatible with a polyamide polymer, said polyamide polymer comprising:

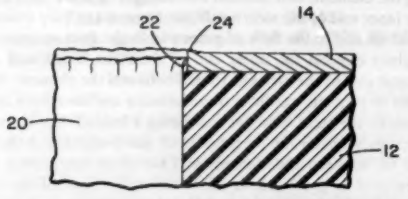
a resinous polyamide reaction product having a molecular weight less than about 10,000 and being prepared from a polyoxypropylene polyamine selected from the group consisting of diamines, triamines and mixtures thereof, and having an average molecular weight of about 190 to about 3,000, piperazine and an aliphatic or aromatic dicarboxylic acid, ester or anhydride having about 4 to about 20 carbon atoms per molecule.

4,162,932

METHOD FOR REMOVING RESIN SMEAR IN THROUGH HOLES OF PRINTED CIRCUIT BOARDS

Jiri Konicek, Florence, Mass., assignor to Perstorp, AB, Perstorp, Sweden

Filed Oct. 26, 1977, Ser. No. 845,584
Int. Cl.[2] C03C 15/00, 25/06
U.S. Cl. 156—630 3 Claims



1. In a method for the production of through holes in a laminate used for printed wiring and consisting of an insulating base of glass fiber reinforced thermosetting resin provided on at least one side with a thin continuous layer of copper or copper alloy, comprising laminating said layer of copper or copper alloy under heat and pressure to a final base-forming material consisting of at least one sheet of glass fiber reinforced thermosetting resin, and subsequently drilling or punching holes in said laminate causing the formation of resin smear in said layer of copper or copper alloy, the improvement consisting of applying a water-jet stream to said resin smear to remove it from said laminate.

4,162,933

EXOTHERMIC HEAT AS A MEANS OF DETERMINING THE DEGREE OF DELIGNIFICATION

Michael I. Sherman, and James R. Prough, both of Glens Falls, N.Y., assignors to Kamyr Inc., Glens Falls, N.Y.

Continuation of Ser. No. 722,414, Aug. 24, 1976, abandoned, which is a continuation of Ser. No. 555,269, Mar. 4, 1975, abandoned, which is a continuation of Ser. No. 360,472, May 15, 1973, abandoned. This application Jul. 7, 1977, Ser. No. 813,648
Int. Cl.[2] D21C 3/24
U.S. Cl. 162—17 5 Claims

1. A continuous process for digesting cellulosic fibrous material in an elongated vertical continuous digester to provide pulp having a desired predetermined degree of delignification, comprising the steps of:

continuously charging cellulosic fibrous material into the top of the digester at a substantially constant rate;

impregnating the cellulosic fibrous material with digesting liquor;

while maintaining substantially steady-state conditions, treating the material with heated digesting liquor while passing the material through a digesting stage of the digester so that the material undergoes a delignification reaction and so that the material is delignified;

discharging the delignified material from the bottom of the digester at a substantially constant rate;

continuously determining the exothermic heat of the delignification reaction in the digesting stage, and thereby determining the degree of delignification occuring in the digesting stage, by (i) determining the temperature rise occurring during the delignification reaction in the digesting stage, which step is accomplished by measuring the temperature of fibrous material and liquid generally adjacent the top of the digesting stage, and measuring the temperature of fibrous material and liquid generally adjacent the bottom of the digesting stage, and (ii) by determining the heat capacity of the cellulosic material and digesting liquor in the digesting stage;

comparing the degree of delignification occurring in the digesting stage with the desired predetermined degree of delignification; and

adjusting the amount of cellulosic fiber material continuously charged into the top of the digester to maintain the desired predetermined degree of delignification.

4,162,934

METHOD OF PRODUCING SORPTION BODIES

Per Norbäck, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Oct. 25, 1977, Ser. No. 845,433
Claims priority, application Sweden, Oct. 26, 1976, 7611888
Int. Cl.[2] C04B 43/04; D21D 3/00
U.S. Cl. 162—155 2 Claims

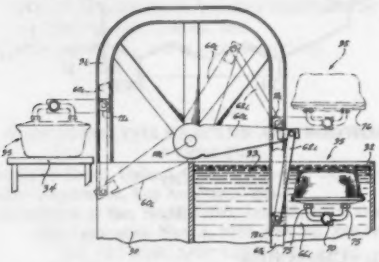
1. The method of producing a sorption body comprising the steps of forming sheets of asbestos paper from asbestos fibre pulp having molecular sieves placed therein; arranging the sheets in contact with each other at spaced points to form transectional channels therebetween for the media which are to pass through the body with the sheets supporting each other; subjecting the sheets to an increase in temperature sufficient to drive off the organic binding agents present in the paper and to break down the asbestos fibre into an amorphous

product; said step of subjecting the sheet to an increase in temperature comprising the steps of subjecting the sheets first to a temperature of between 400° C. and 500° C. to burn off the organic constituents of the asbestos sheets and then heating the sheets to a temperature of between 700° C. and 800° C. to convert the asbestos fibres to a powdery consistency; and thereafter applying a further stiffening coating of at least one, preferably inorganic, constituent by precipitating the coating onto the sheets.

4,162,935
PAPIER-MACHÉ COFFIN AND METHOD OF MAKING IT

Harry Kollmann, Calgary, Canada, and Roland H. Goetsch, Milwaukee, Wis., assignors to Idra AG, Switzerland

Division of Ser. No. 618,753, Oct. 2, 1975, Pat. No. 4,034,447. This application May 31, 1977, Ser. No. 801,858
Int. Cl.² D21J 7/00
U.S. Cl. 162—220 **7 Claims**

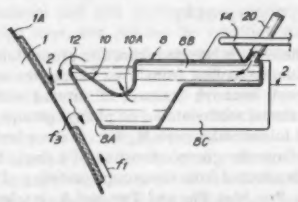


1. The methed of molding a coffin for an adult human being of papier-mache from molds formed of a pervious material such as screen comprising; immersing the mold in a slurry of paper pulp in an inverted position so that the coffin is formed on the mold with its open top facing downwardly; applying a suction to the interior of the mold to draw the paper pulp onto the face of the mold while it is in said inverted position whereby the paper pulp on the mold will tend to flow downwardly by gravity along the face of the mold to form a heavier concentration of pulp along the open edge of the coffin to strengthen this area of the coffin structure; removing the mold with the paper pulp on it out of the slurry of pulp; applying suction to the interior of the mold to remove water from the pulp that is on the mold and compacting it; and applying air pressure to the interior of the mold to release the papier-mache coffin from the mold.

4,162,936
WASHING DEVICE FOR IMPERMEABLE AREAS OF CYLINDER MOLDS

Armando Frezzotti, Fabriano, Italy, assignor to Fibrostampa S.R.L., Milan, Italy

Filed Dec. 19, 1977, Ser. No. 861,633
Claims priority, application Italy, Dec. 23, 1976, 9713 A/76
Int. Cl.² D21F 1/32, 1/44
U.S. Cl. 162—276 **10 Claims**

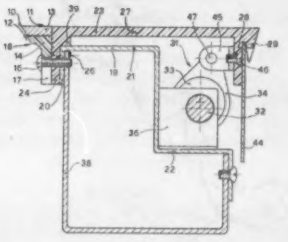


10. In a machine for the manufacture of fiber-containing materials, a rotating cylinder partly immersed in a body of liquid containing fibers in suspension within a tank, the cylinder having a circumferential surface defined by permeable areas and impermeable areas arranged in a predetermined pattern, means for applying a suction to the permeable areas from within the cylinder so that fibers are drawn onto said permeable areas during rotation of the cylinder in the liquid, conveyor belt means adjacent a portion of the cylinder out of contact with the liquid, means enabling transfer of the fibers from said permeable layers to the conveyor belt means, and means for washing the impermeable areas of the cylinder surface upstream of said portion of the cylinder by feeding water across an overflow edge into a space adjacent the cylinder whereby to remove fibers from said impermeable areas by flowing water parallel thereto.

4,162,937
WATER-REMOVAL BLADE FOR PAPER-MAKING MACHINES

Glauco Corbellini, Via Carducci, 33100 Udine, Italy

Filed Jan. 13, 1975, Ser. No. 540,578
Claims priority, application Italy, Jan. 14, 1974, 83304 A/74; Nov. 11, 1974, 83421 A/74
Int. Cl.² D21F 1/48
U.S. Cl. 162—352 **2 Claims**



1. A water-removal device for paper-making machines comprising support means, a blade element having a leading edge made of hard wear-resistant material, means for anchoring said blade element to said support means, an upper bendable surface positioned behind said blade element, and bending means constructed and arranged with said upper bendable surface for bending said bendable surface to create a venturi effect, said bending means including activating and positioning means and being constructed and arranged to provide continuous adjustment to the bending of said bendable surface during the operation of said paper-making machine and wherein said bending means includes a plane surface having a front anchorage means at one end thereof, and a connecting section at the other end thereof; and in reciprocal coordination a drive shaft positioned below and transversely to said upper bendable surface and said activating and positioning means being a lever attached to said drive shaft; a plurality of cams cooperating with a connecting rod in a swinging manner to a fork solidly fixed to the connecting section of said upper bendable surface.

2. A water-removal device for paper-making machines comprising support means, a blade element having a leading edge made of hard wear-resistant material, means for anchoring said blade element to said support means, an upper bendable surface positioned behind said blade element, and bending means constructed and arranged with said upper bendable surface for bending said bendable surface to create a venturi effect, said bending means including activating and positioning means and being constructed and arranged to provide continuous adjustment to the bending of said bendable surface during the operation of said paper-making machine and wherein said bending means includes in reciprocal coordination a drive shaft with said positioning and activating means being a lever attached to said drive shaft; and a plurality of cams cooperating with the

two continuous opposed faces of a C-shaped element positioned below and in cooperation with said bendable surface.

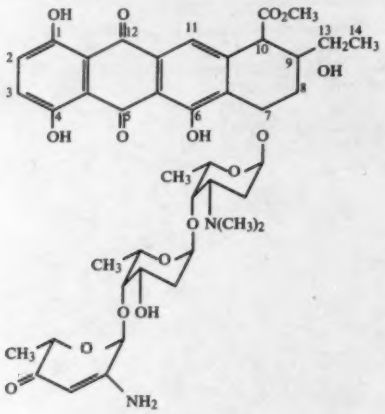
4,162,938

ANTIBIOTIC COMPOUND

Donald E. Nettleton, Jr., Jordan; Terrence W. Doyle, Fayetteville, and William T. Bradner, Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 872,291, Jan. 25, 1978, Pat. No. 4,123,608, which is a continuation-in-part of Ser. No. 816,427, Jul. 18, 1977, abandoned. This application May 30, 1978, Ser. No. 910,408
Int. Cl.[2] C12D *9/14*
U.S. Cl. 435—75 2 Claims

1. A process for preparing rudolphomycin having the structural formula



which comprises cultivating Actinosporangium sp. ATCC 31127 in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of rudolphomycin is produced by said organism in said culture medium and isolating and recovering said rudolphomycin from the culture medium substantially free of substances co-produced therewith.

4,162,939

METHOD FOR THE CULTIVATION OF BASIDIOMYCETES BELONGING TO THE GENUS CORIOLUS OF POLYPORACEAE

Chikao Yoshikumi, Kunitachi; Takao Furusho, Tokyo; Kenichi Matsunaga, and Noriyuki Toyoda, both of Hino, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 824,117
Claims priority, application Japan, Aug. 30, 1976, 51-102628
Int. Cl.[2] C12D *13/04;* C12B *1/08, 3/12*
U.S. Cl. 435—254 4 Claims

1. In a method of cultivation of a Basidiomycete belonging to the genus Coriolus comprising cultivating said Basidiomycete in a synthetic culture medium at a temperature of 25°±3° C., under stationary or submerged conditions, the wherein improvement comprises:

cultivating said Basidiomycete in a glucose-yeast extract culture medium consisting of 7.5 to 15% by weight of glucose, yeast extract and water, with the weight ratio of glucose to yeast extract being 3:1 to 15:1.

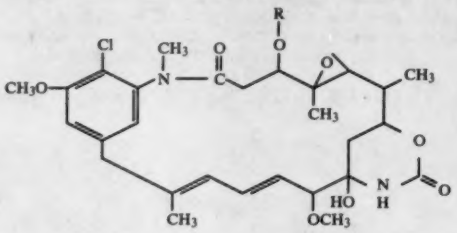
4,162,940

METHOD FOR PRODUCING ANTIBIOTIC C-15003 BY CULTURING NOCARDIA

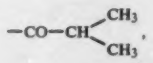
Eiji Higashide, Takarazuka; Mitsuko Asai, Takatsuki, and Seiichi Tanida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,448
Claims priority, application Japan, Mar. 31, 1977, 52-37166; Apr. 1, 1977, 52-37886
Int. Cl.[2] C12D *9/20*
U.S. Cl. 435—119 2 Claims

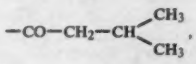
1. A method for producing Antibiotic C-15003 which has the general formula:



wherein R represents



—CO—CH_2—CH_2—CH_3 or



which comprises cultivating a microorganism belonging to the genus Nocardia and being capable of producing Antibiotic C-15003 in a culture medium containing assimilable carbon sources and digestible nitrogen sources until Antibiotic C-15003 is substantially accumulated therein, and recovering Antibiotic C-15003.

4,162,941

METHOD FOR DETERMINING A PROTEOLYTIC ENZYME

Leif E. Aurell, Molndal, and Karl G. Claeson, Saro, both of Sweden, assignors to AB Kabi, Stockholm, Sweden

Division of Ser. No. 631,974, Nov. 14, 1975, Pat. No. 4,028,318. This application Mar. 4, 1977, Ser. No. 774,350
Claims priority, application Sweden, Dec. 5, 1974, 7415229
Int. Cl.[2] G01N *31/14*
U.S. Cl. 435—23 12 Claims

1. A method for diagnostic determination of a proteolytic enzyme designated as Xa factor which comprises contacting said proteolytic enzyme with a chromogenic substrate represented by the following formula:

R_1-A_1-A_2-Gly-Arg-NH-R_2

or its salts, where R_1 is selected from the group consisting of hydrogen, alkanoly having from 1 to 12 carbon atoms, cyclohexylcarbonyl, benzoyl, benzoyl substituted with one or two halogen atoms, methylamine or phenyl groups, benzene sulphonyl and toluenesulphonyl; R_2 is a chromophoric group; Al is selected from the group consisting of a single bond, and the amino acids selected from the group consisting of Gly, Ala, Val, Leu, Ileu, Pro, Met, Phe and Tyr; and A_2 is selected from the group consisting of the amino acids Glu, Gln, Asp, and

Asn, and then spectrophotometrically measuring the degree of enzymatic hydrolysis caused by said proteolytic enzyme acting on said substrate.

4,162,942

MONITORING ETHYLENE OXIDE STERILIZATION RESIDUAL WITH ENZYMES

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed May 17, 1977, Ser. No. 797,736
Int. Cl.[2] C12K *1/00*; G01N *31/14*
U.S. Cl. 435—17 **13 Claims**

1. A method for determining the presence of ethylene oxide residual in a material previously sterilized with ethylene oxide comprising

(a) contacting said material with an extracting agent so as to remove at least a portion of any ethylene oxide sterilization residual present in the material,

(b) reacting said extracted ethylene oxide sterilization residual with enzyme which becomes inactivated by ethylene oxide sterilization residual, and

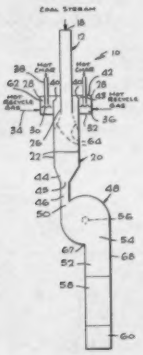
(c) determining the loss of enzyme activity.

4,162,943

SLOT PYROLYSIS REACTOR AND METHOD OF PYROLYSIS

Norman W. Green, Upland, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 699,995, Jun. 25, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,711
Int. Cl.[2] B04C *5/04*; C10B *1/04, 49/16*
U.S. Cl. 201—12 **36 Claims**



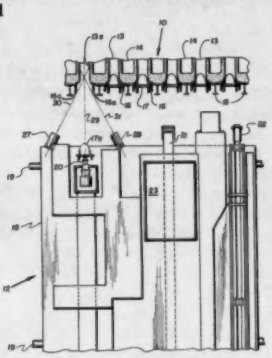
15. A pyrolysis process which comprises passing a high velocity stream of a particulate primary material to be pyrolyzed through a rectangular slot to form a high velocity slot jet of said particulate material having a rectangular cross section, injecting said slot jet into a substantially rectangular pyrolysis zone, introducing a fluidized particulate secondary material as heat source into said pyrolysis zone and mixing said particulate primary material and said particulate secondary material in said pyrolysis zone, and passing the resulting stream of said mixed particulate primary and secondary materials through said pyrolysis zone and pyrolyzing said mixture therein, passing the resulting stream of pyrolysis products through a chamber having a rectangular cross section which reduces in size in the direction of flow, introducing said stream of pyrolysis products tangentially into a cylindrical separator zone, removing solids from said separator zone after said stream has passed around only a fraction of the circumference of said separator zone and removing gases from said separator zone.

4,162,944

SPOTTING METHOD AND APPARATUS FOR COKE OVEN BATTERIES

John A. Belcher, Pleasant Hills Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 11, 1977, Ser. No. 850,768
Int. Cl.[2] C10B *33/10, 41/02*; G01S *5/16*
U.S. Cl. 201—41 **8 Claims**



1. A method of spotting a machine in relation to an open hot coke oven, the walls of which have incandescent surfaces, so that a part of the machine is aligned accurately with the oven, said method comprising aiming detectors at oblique angles toward the extended center line of said part from both the left and right sides thereof, and positioning the machine where both said detectors "see" directly the incandescent surfaces of the walls at opposite sides of the open oven simultaneously.

4,162,945

INSTALLATION AND PROCESS FOR MULTISTAGE-CONTROLLED FLASH EVAPORATION

Marinus J. Hofstede, Berkel & Rodenrys; Gerardus Beentjes, Opmeer, both of Netherlands; Laslo Szücs, and Csaba Tasnádi, both of Budapest, Hungary, assignors to Cojafex B.V., Rotterdam, Netherlands

Filed Apr. 7, 1977, Ser. No. 785,715
Int. Cl.[2] B01D *1/22*
U.S. Cl. 202—173 **11 Claims**

1. Multi-stage flash evaporator, in particular suitable for the desalinization of sea water, comprising at least one, essentially slot-shaped, generally downwardly extending passage channel leading from the upper supply of liquid to be evaporated to the lower exhaust of unevaporated liquid, which passage channel

constitutes a series of alternately snail-shell-shaped convolute spaces and bag-shaped buffer spaces acting as a liquid lock or syphon, in the former spaces having a vapor exhaust near their center, and with centrifugal force the separation of vapor from liquid taking place and in the latter spaces mainly transportation of unevaporated liquid from a snail-shell-shaped space to the next lower snail-shell-shaped space taking place.

4,162,946
PROCESS FOR CONCENTRATING HALOGENOANTHRAQUINONES

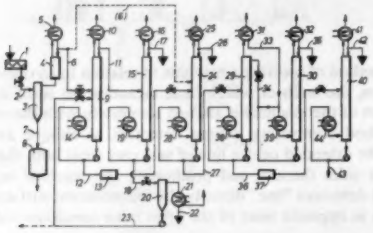
Bernd Thelen, Leverkusen; Norbert Majer, Schildgen; Reinold Schmitz, Blecher, and Hans-Samuel Bien, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 637,489, Dec. 3, 1975, abandoned. This application Sep. 1, 1977, Ser. No. 829,848

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 2458022; Jul. 17, 1975, 2531929

Int. Cl.[2] B01D *3/10, 3/28;* **C07C** *49/68*

U.S. Cl. 203—72 **20 Claims**



1. A process for concentrating a feed comprising essentially mono-, di- or tri-halogenated anthraquinones or mixtures thereof which comprises subjecting said feed containing at least two of said mono-, di- or tri-halogenated anthraquinones or mixture thereof to fractional vacuum distillation in a heated rectification column or a cascade of columns having an efficiency corresponding to about 20 to 50 theoretical stages with an absolute pressure at the top of about 0.5 to 50 mm Hg and a reflux to take-off ratio of about 5/1 to 50/1 to provide a concentrated halogenoanthraquinone fraction and withdrawing overhead as distillate the concentrated halogenoanthraquinone fraction.

4,162,947
ACID ZINC PLATING BATHS AND METHODS FOR ELECTRODEPOSITING BRIGHT ZINC DEPOSITS

Valerie M. Canaris, Parma, Ohio, assignor to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed May 22, 1978, Ser. No. 908,567

Int. Cl.[2] C25D *3/22*

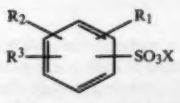
U.S. Cl. 204—55 R **20 Claims**

1. An aqueous acidic plating bath for the electrodeposition of a bright zinc deposit on a substrate which comprises

(A) zinc ions,

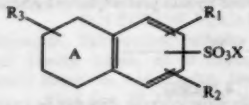
(B) ammonium ions, and

(C) a mixture of aromatic sulfonic acids or salts thereof comprising at least one compound having the general formula



I

and at least one compound having the general formula



II

wherein

R_1, R_2 and R_3 are each independently hydrogen or lower alkyl groups,

X is hydrogen, ammonia or any metal with the proviso that the metal sulfonate is soluble in the bath, and

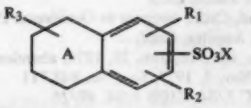
A is a saturated, unsaturated or aromatic ring.

18. An additive composition for an aqueous acidic zinc electroplating bath comprising a mixture of

(a) at least one aromatic sulfonic acid or salt having the general formula

I

(b) at least one aromatic sulfonic acid or salt having the general formula



II

wherein

R_1, R_2 and R_3 are each independently hydrogen or lower alkyl groups,

X is hydrogen, ammonia or any metal with the proviso that the metal sulfonate is soluble in the bath, and

A is a saturated, unsaturated or aromatic ring,

(c) at least one polyoxyalkylated naphthol or a polyalkylene glycol ether, and

(d) an aromatic carbonyl-containing compound.

4,162,948
METHOD OF DEHALOGENATING HALOGENATED HYDROCARBON TO YIELD ELEMENTAL HALOGEN

Kiyoshi Yagii, Kamifukuoka, and Hideki Oshio, Kawagoe, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 13, 1978, Ser. No. 895,962

Claims priority, application Japan, Apr. 26, 1977, 52/47385

Int. Cl.[2] C25B *3/02*

U.S. Cl. 204—80 **10 Claims**

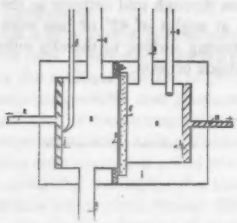
1. A method of dehalogenating a halogenated hydrocarbon with liberation of the detached halogen in elemental form, the method comprising the step of subjecting to electrolysis a reaction system containing water, a halogenated hydrocarbon to be dehalogenated, said halogenated hydrocarbon in said reaction system is a halogenated alkane having at least two but not more than three carbon atoms and at least two atoms of at least one halogen selected from the group consisting of fluorine, chlorine and bromine; with the proviso that the halogens to be removed are on different carbon atoms, zinc chloride and a detergent.

4,162,949

REDUCTION OF STEEL CATHODE OVERPOTENTIAL

Kenneth E. Hine, St. Bruno, Canada, assignor to Canadian Industries Limited, Montreal, Canada

Filed Nov. 17, 1978, Ser. No. 961,629
Claims priority, application Canada, Nov. 23, 1977, 291588
Int. Cl.[2] C25F *1/06, 3/06*
U.S. Cl. 204—140 5 Claims



1. A method for reducing the hydrogen overpotential at the steel cathode of a cell for the electrolysis of brine comprising:

(a) immersing the steel cathode in an alkaline electrolyte of alkalinity ranging from pH 8 to 50% by weight sodium hydroxide in the presence of a counter electrode; and

(b) polarizing the steel cathode anodically at a current density of 0.015 to 0.1 kiloampere per square meter and at a temperature of 0° C. to 75° C. for a period of 0.5 to 60 minutes.

4,162,950

TREATMENT OF EFFLUENTS

John J. MacGregor, Tokers Green, England, assignor to Matthey Rustenburg Refiners (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 815,005, Jul. 12, 1977, Pat. No. 4,127,458. This application Sep. 15, 1978, Ser. No. 942,814
Claims priority, application United Kingdom, Jul. 13, 1976, 29093/76
Int. Cl.[2] C25C *1/20*
U.S. Cl. 204—149 2 Claims

1. A process for recovering platinum group metal present as a stable complex dissolved in an aqueous effluent from a platinum group metals refinery which comprises (1) adjusting the pH of the effluent as necessary to an alkaline pH of at least 10; (2) heating the effluent to a temperature above 60° C.; (3) electrolyzing the effluent at said temperature and alkaline pH using an anode potential having a half-cell voltage of at least 7.5 volts and a current density of at least 0.2 A/cm^2 so as to break down said complex by anodic oxidation and precipitate metal present in the complex; and (4) filtering off the thus precipitated metal.

4,162,951

ELECTROPLATING APPARATUS WITH SELECTIVELY INTERCHANGEABLE, CONNECTABLE DRUMS

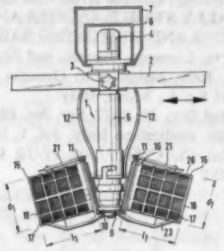
Richard Tscherwitschke, Dieselstrasse 21, Leinfelden-Echterdingen, Fed. Rep. of Germany (7022), and Hans Henig, Albrecht-Achilles-Str. 48, Nuremberg, Fed. Rep. of Germany (8500)

Filed Oct. 27, 1978, Ser. No. 955,165
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748763
Int. Cl.[2] C25C *7/00*
U.S. Cl. 204—213 13 Claims

1. A device to facilitate electroplating of a plurality of small elements by moving said elements in an electroplating solution while at the same time passing an electroplating current into said solution, said apparatus comprising:

at least one cylindrical drum means for containing and supporting said elements in said solution, said drum means including a cylindrical portion having two ends and one end portion fixed across one end of said cylinder, at least one of said portions permitting said solution to flow therethrough;

cover means for removably covering said other end of said cylindrical portion forming a closed container through which said solution may pass;



connecting means removably connecting said other end to said cover means;

rotation means, connected to said cover means, for rotating said cover means and said drum means in said solution about an axis of rotation; and

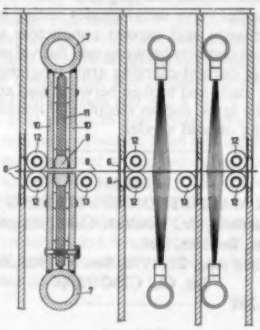
current means for supplying an electroplating current through said cover means and into said drum means.

4,162,952

APPARATUS FOR ELECTROLYSIS BY PROJECTION

Michel Tribout, Breuillet, France, assignor to Societe Anonyme dite: F.M.C., Pierrelaye, France

Filed Feb. 23, 1978, Ser. No. 880,845
Int. Cl.[2] C25D *7/06, 17/00*
U.S. Cl. 204—224 R 4 Claims



1. Electrolysis apparatus for deposition or removal of a metal on at least partially electrically conductive parts comprising a closed chamber, means for conveying flat parts through said chamber along a pre-determined path, means for projecting a sheet of electrolyte transversely of and toward said path so that the sheet of electrolyte impinges on the articles moving along the path, electrode means upstream of said projecting means for electrical connection to one side of an energizing circuit, means for connecting said flat parts to the other side of the energizing circuit during travel of the parts through said chamber, additional chambers adjacent to said first mentioned closed chamber, and wherein an exit opening of one chamber is the inlet opening of the next adjacent chamber, seal means between said chambers for isolating said chambers from each other while permitting the passage of said flat parts through said chambers, said seal means permitting main-

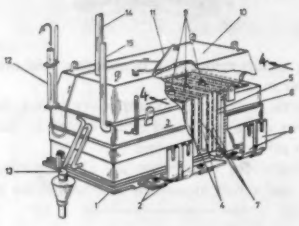
tenance of a neutral gas pressure within said chambers to prevent entrance of atmospheric air into said chambers, and means in said additional chambers for further treating said parts by projecting a liquid sheet toward said parts in said additional chambers.

4,162,953

MONOPOLAR ELECTROLYTIC DIAPHRAGM CELLS WITH REMOVABLE AND REPLACEABLE DIMENSIONALLY STABLE ANODES AND METHOD OF INSERTING AND REMOVING SAID ANODES

Oronzio De Nora; Giuseppe Bianchi, and Giovanni Meneghini, all of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Dec. 21, 1977, Ser. No. 862,674
Claims priority, application Italy, Jul. 1, 1977, 25326 A/77
Int. Cl.[2] C25B *11/03, 11/10, 9/04*
U.S. Cl. 204—252 **11 Claims**



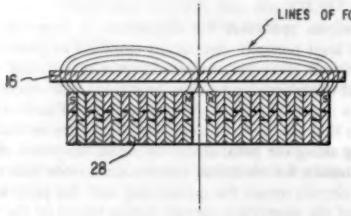
1. In a monopolar electrolytic cell, a conductive bottom, a cell can, containing spaced, hollow, tubular, diaphragm-covered cathodes, on said cell bottom, a cell top, positive current connections to said bottom, negative current connections to said cell can, spaced current conductors electrically connected to and extending upward from said cell bottom between said cathodes, flexible current-carrying arms on said current-carrying conductors, flat valve metal anodes resting loosely on said cell bottom between said current conductors and said cathodes, spring-held contacts between said flat valve metal anodes and said flexible current-carrying arms whereby current connection can be made and broken between said anodes and said current-carrying arms, and an electrically conducting electrocatalytic coating on said anodes.

4,162,954

PLANAR MAGNETRON SPUTTERING DEVICE

Charles F. Morrison, Jr., Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Aug. 21, 1978, Ser. No. 935,358
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **42 Claims**



1. In a planar magnetron sputtering device including a cathode of target material to be sputtered; wherein said cathode includes a planar sputtering surface, at least a portion of which is disposed about a center line perpendicular to the plane of said surface, an anode adapted for establishing an accelerating electric field between said anode and cathode and magnetic means for establishing a magnetic field adjacent the planar sputtering surface of said cathode for lengthening the path traveled by electrons removed from said cathode; and wherein the lines of force of the magnetic field extend over the planar sputtering surface of said cathode and pass through the cathode in the vicinity of said center line,

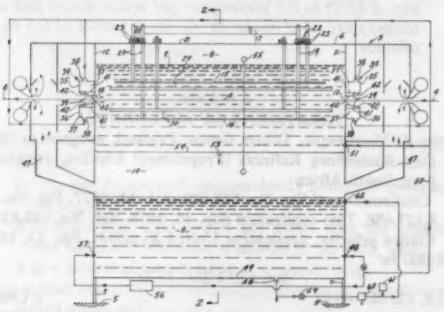
the improvement where said magnetic means comprises means for causing a majority of said magnetic lines of force to pass through said cathode in the vicinity of said center line at angles of 45° or less with respect to said planar sputtering surface to thereby enhance the uniformity of cathode erosion.

4,162,955

ELECTRODEPOSITION COATING APPARATUS

Alex J. Schregenberger, Neshanic, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 10, 1978, Ser. No. 949,873
Int. Cl.[2] C25D *17/02, 13/16*
U.S. Cl. 204—299 EC **18 Claims**



1. An apparatus in which a traveling web, such as a continuous sheet of metal, is treated, comprising:

(a) a tank having a horizontally elongated treatment chamber for holding a liquid used in the treatment of the web as it travels through the chamber, the tank having longitudinally spaced end walls with horizontally aligned openings through which the traveling web enters and exits the chamber;

(b) a liquid seal adjacent each of the openings in the end walls to prevent the escape of liquid from the chamber through the openings, each liquid seal comprising:

(I) a pair of parallel, elongated nozzles disposed normal to the direction in which the web travels, each of the nozzles having a longitudinal compartment with an inlet and at least one longitudinally extending slot facing the traveling web, the slot being at least coextensive with an adjacent opening;

(II) means for circulating liquid, under pressure, through the inlet into the compartment and uniformly out through the slot of each of the nozzles; and

(III) means adjacent the slots for directing liquid, under pressure, from the slots angularly against the traveling web at an angle substantially less than 90° relative to the plane of the web, in the direction of the chamber to create a turbulent back flow of liquid of sufficient mass and velocity to, (i) block the escape of liquid through the openings, and (ii) support the traveling web adjacent the end walls.

4,162,956

COAL DEASHING PROCESS HAVING IMPROVED SOLVENT RECOVERY TECHNIQUES

Donald E. Rhodes, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,866
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 LE 13 Claims

1. A process comprising:

mixing in a first mixing zone a process solvent with coal;

solubilizing the coal at elevated temperature and pressure and flashing the resultant mixture to produce a prepared mixture comprising soluble coal products, insoluble coal products and some of the process solvent;

mixing the prepared mixture with a deashing solvent in a second mixing zone to provide a feed mixture, said deashing solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benezene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

introducing the feed mixture into a first separation zone and separating said mixture into a first heavy fraction comprising insoluble coal products and some deashing solvent and first light fraction comprising soluble coal products, deashing solvent and some process solvent;

withdrawing the first heavy fraction from the first separation zone;

introducing the first light fraction into a third mixing zone;

introducing at least a portion of a third light fraction from a third separation zone into the third mixing zone to mix with the first light fraction contained therein;

withdrawing the mixture from the third mixing zone;

introducing the mixture into a second separation zone;

separating the mixture in the second separation zone into a second heavy fraction comprising soluble coal products and some deashing solvent and a second light fraction comprising deashing solvent and some process solvent;

withdrawing the second heavy fraction from the second separation zone;

withdrawing the second light fraction from the second separation zone;

introducing the second light fraction into a third separation zone;

separating the second light fraction into a third heavy fraction comprising process solvent and a third light fraction comprising deashing solvent;

withdrawing the third light fraction from the third separation zone;

returning at least a portion of the third light fraction comprising deashing solvent to the third mixing zone for introduction therein;

returning the remaining third light fraction to the second mixing zone to aid in providing the feed mixture;

withdrawing the third heavy fraction from the third separation zone; and

returning at least a portion of the third heavy fraction to the first mixing zone to aid in solubilizing said coal.

4,162,957

METHOD OF FEEDING SOLIDS TO A PROCESS UNIT

Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 888,283
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 R 18 Claims

1. A process for simultaneously melting and introducing a solid, coal derived feed into a process unit comprising:

introducing said solid, coal derived feed into an extruder;

heating said solid, coal derived feed within said extruder to melt said feed and provide a molten feed;

discharging said molten feed from said extruder at an elevated pressure; and

introducing said discharged molten feed into a process unit.

4,162,958

PROCESS FOR THE DISCHARGE OF ASH CONCENTRATE FROM A COAL DEASHING SYSTEM

Roger A. Baldwin, Warr Acres, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 888,104
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 LE 5 Claims

1. In a process for separating a feed mixture comprising soluble coal products, insoluble coal products and a solvent in a separation zone, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs, in which said feed mixture is maintained in said separation zone at an elevated temperature and pressure to separate said feed mixture into a light fraction and into a heavy fraction comprising insoluble coal products and some solvent and in which withdrawing said heavy fraction from said separation zone and reducing the pressure level of said heavy fraction at least about 100 psig fails to yield a dry, powdery, ash concentrate composition, the improvement which comprises:

reducing the temperature level of the heavy fraction after pressure reduction to a temperature level below about 550 degrees F. to continuously yield a dry, powdery, ash concentrate composition.

4,162,959

PRODUCTION OF HYDROGENATED HYDROCARBONS

Kandaswamy Duraiswamy, Laverne, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 699,993, Jun. 25, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,294
Int. Cl.[2] C10G *1/00, 1/06;* C10B *49/16, 53/06*
U.S. Cl. 208—8 R 26 Claims

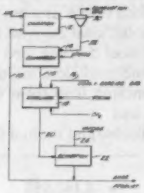
20. A continuous process for recovery of liquid hydrocarbon values from a particulate coal feed comprising the steps of:

(a) oxidizing particulate char resulting from pyrolysis of the particulate coal feed in an oxidation zone in the presence of a source of oxygen to produce hot particulate char and a combustion gas;

(b) passing hot particulate and combustion gas from the oxidation zone to a separation zone and separating in the separation zone hot particulate char from the combustion gas;

(c) pyrolyzing the particulate coal feed by introducing the

particulate coal feed and a particulate source of heat including hot particulate char from the separation zone in a flash pyrolysis reaction zone having a temperature of from about 600° to about 2000° F. and a solids residence time less than 5 seconds to yield a pyrolysis product stream containing particulate char and a vapor mixture comprising volatilized hydrocarbons including middle distillates;



(d) introducing into the pyrolysis reaction zone carbon dioxide in an amount of about 0.1 to about 20 SCF per pound of hot particulate char introduced for interaction with char therein for avoiding catalytic cracking of volatilized hydrocarbons; and

(e) condensing hydrocarbons including middle distillates from the vapor mixture.

4,162,960

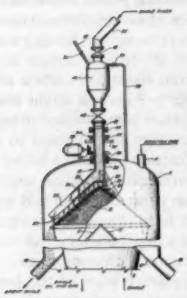
SHALE RETORTING PROCESS AND APPARATUS

Roland O. Dhondt, Long Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Mar. 29, 1978, Ser. No. 891,280

Int. Cl.[2] C10G *1/02;* C10B *31/02, 49/06, 53/06*

U.S. Cl. 208—11 R **12 Claims**



1. In a shale retorting process wherein a bed of granular crushed oil shale essentially free of particles having a diameter less than about 1/16 inch and above about 4 inches is passed upwardly through a retort, countercurrently to a preheated downflowing oxygen-free eduction gas to educe product oil and gas therefrom, and wherein spent shale is allowed to overflow by gravity from the top perimeter of said retort thereby forming a free-standing cone of spent shale extending above the top of said retort through which said preheated downflowing eduction gas passes, the improved method for retorting raw crushed oil shale fines essentially free of particles having a diameter greater than about ¼ inch which comprises:

(1) distributing said raw shale fines over an upper portion of the surface of said cone of spent shale at a rate no greater than about 15 weight-percent of total raw shale, including fines, being fed to said retort, said upper portion of surface being selected so as to provide a sufficient residence time of said shale fines gravitating down the surface of said cone to the perimeter of said retort to effect retorting of said fines; and

(2) controlling the flow rate and the temperature of said eduction gas so as to produce product gas and oil from said upflowing shale and said shale fines.

4,162,961

CYCLE OIL CONVERSION PROCESS

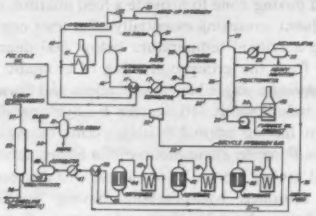
Joseph F. Marmo, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 393,894, Sep. 4, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,066

Int. Cl.[2] C10G *39/00*

U.S. Cl. 208—57 **7 Claims**

1. A process which comprises contacting a feed consisting essentially of cycle oil and containing at least 65 volume percent aromatics with a hydrogenation catalyst in a hydrogenation zone under hydrogenation conditions, such hydrogenation catalyst comprising a metal of Group VI-B and a metal of Group VIII composited with an alumina support, recovering a furnace oil fraction from the hydrogenation zone effluent,



recovering a naphtha fraction from said hydrogenation effluent, passing said recovered naphtha fraction to a reforming zone containing a reforming catalyst, maintaining reforming conditions within said reforming zone, and recovering a reformate product from said reforming zone.

4,162,962

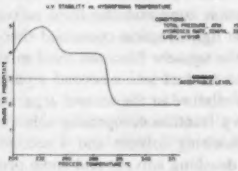
SEQUENTIAL HYDROCRACKING AND HYDROGENATING PROCESS FOR LUBE OIL PRODUCTION

Bruce E. Stangeland, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1978, Ser. No. 945,743

Int. Cl.[2] C10G *13/02, 37/06;* B01J *35/10*

U.S. Cl. 208—58 **11 Claims**



1. A process for upgrading a hydrocrackate lube oil stock boiling in the range above 290° C. and having a UV stability below 3 hours, comprising: (1) contacting said stock and hydrogen gas with a catalyst containing Group VI-B and Group VIII hydrogenating components disposed upon a porous carrier consisting essentially of alumina having a pore volume in the range of from about 0.4 to 1.1 cc per gram, of which at least 70% is in pores having diameters in the range of from about 80 to 150 Angstroms, said contacting being under hydrogenating conditions, including (a) a temperature in the range of from about 200° to 300° C., (b) a total pressure in the range of from about 129 to 171 atmospheres, (c) a hydrogen rate in the range of from about 382 to 509 standard cubic meters of hydrogen gas per kiloliter of feed, and (d) a liquid hourly space velocity in the range of from about 1 to 3 V/V/hr, said Group VI-B component being selected from the group consisting of molybdenum and tungsten, and said Group VIII component being selected from the group consisting of cobalt and nickel, said components being in at least one of the metal, oxide and sulfide forms thereof, and being present in a total effective amount,

calculated as metal and based upon the catalyst by weight, in the range of from about 1 to 20%; and (2) recovering, as a result of said contacting, a product lube oil having a UV stability of at least 4 hours.

4,162,963

METHOD FOR PRODUCING HYDROCARBON FUELS AND FUEL GAS FROM HEAVY POLYNUCLEAR HYDROCARBONS BY THE USE OF MOLTEN METAL HALIDE CATALYSTS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 21, 1978, Ser. No. 926,785
Int. Cl.[2] B01J *27/32*; C10G *13/02, 1/06*
U.S. Cl. 208—108 **8 Claims**

1. In a process for hydrocracking heavy polynuclear carbonaceous feedstocks to produce lighter hydrocarbon fuels by contacting said heavy feedstocks with hydrogen in the presence of molten zinc chloride catalyst in a hydrocracking zone, thereafter separating at least a major portion of said lighter hydrocarbon fuels from the spent molten zinc chloride and thereafter regenerating the spent molten zinc chloride by incinerating the spent molten zinc chloride by combustion of carbon and sulfur compounds in said spent molten zinc chloride in an incineration zone, the improvemnt comprising:

(a) contacting said heavy feedstocks and said hydrogen in the presence of said molten zinc chloride in said hydrocracking zone at reaction conditions effective to convert a major portion of said heavy feedstocks to lighter hydrocarbon fuels;

(b) contacting said spent molten zinc chloride with oxygen in a liquid phase gasification zone at a temperature and pressure sufficient to vaporize from about 25 to about 75 weight percent of said spent zinc chloride, said oxygen being introduced in an amount sufficient to remove from about 60 to about 90 weight percent of the carbon contained in said spent molten zinc chloride and produce a fuel gas; and

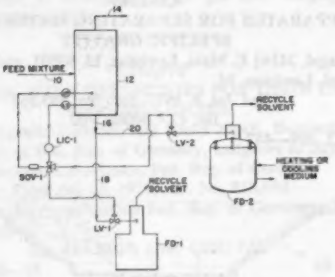
(c) incinerating the remaining molten zinc chloride by combustion of the carbon and sulfur compounds in said remaining molten zinc chloride in an incineration zone to vaporize said remaining zinc chloride.

4,162,964

METHOD OF HANDLING ASH-RICH MATERIAL IN A COAL DEASHING PROCESS

Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,869
Int. Cl.[2] B01D *3/06*; C10G *1/04*; B01D *11/04*
U.S. Cl. 208—177 **4 Claims**



1. A continuous coal deashing process comprising:

introducing a feed mixture comprising soluble coal products, insoluble coal products and a solvent into a separation zone, said solvent consisting essentially of at least one subsubstance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

maintaining said separation zone at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level in the range of from about 700 psig to about 1000 psig to effect a separation of said feed mixture into a light phase and a heavy phase within said separation zone;

providing a monitoring system to measure the viscosity of the heavy phase and compare the measured viscosity with a reference viscosity, said measurement being indicative of the physical characteristics of the heavy phase when withdrawn from the separation zone;

withdrawing the heavy phase from the separation zone; and

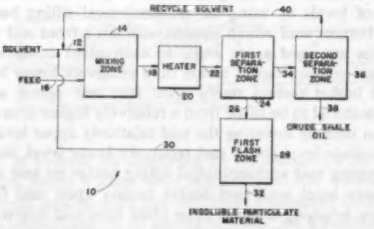
transmitting a signal from the monitoring system to activate a selection means which directs the flow of said withdrawn heavy phase to a flash drum when said measured viscosity exceeds said reference viscosity and to an alternate process unit when said measured viscosity is below said reference viscosity.

4,162,965

PROCESS FOR THE REMOVAL OF SOLID PARTICULATE MATERIALS FROM CRUDE SHALE OILS

Thomas W. Clapper, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 7, 1978, Ser. No. 914,900
Int. Cl.[2] C10G *21/00*
U.S. Cl. 208—177 **17 Claims**



1. A process for reducing the insoluble particulate material content in crude shale oil produced by eduction of oil-bearing shale deposits, comprising:

admixing crude shale oil containing insoluble particulate material with a solvent to provide a feed mixture;

introducing said feed mixture into a first separation zone;

maintaining said first separation zone at a temperature level in the range of from about 400 degrees F. to about 750 degrees F. and a pressure level in the range of from about 500 psig to about 2000 psig to separate said feed mixture in said first separation zone into a first light fraction comprising crude shale oil and solvent and a first heavy fraction comprising insoluble particulate material, some solvent and some crude shale oil;

withdrawing said first heavy fraction separated in said first separation zone; and

withdrawing said first light fraction separated in said first separation zone.

4,162,966

FLOTATION OF DEEP MINED COAL WITH WATER-IN-OIL EMULSIONS OF SODIUM POLYACRYLATE

Robert E. Finch, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 696,460, Jun. 16, 1976, abandoned, and Ser. No. 807,770, Jun. 20, 1977, abandoned. This application Jan. 19, 1978, Ser. No. 870,559

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 5 Claims

1. A method of increasing the yield of deep mined coal undergoing a concentration treatment of froth flotation by using as a flotation promoter an invertible water-in-oil emulsion of sodium polyacrylate latex in a dosage calculated as 0.017–0.5 lb of dry sodium polyacrylate per ton of dry coal and recovering a concentrate of said coal in said froth.

4,162,967

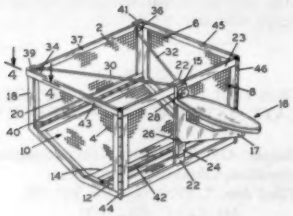
ARCHAEOLOGICAL SIFTING BASKET

Ralph F. Gironda, Jr., 147 Webster Ave., New Rochelle, N.Y. 10801

Filed Dec. 14, 1977, Ser. No. 860,553

Int. Cl.[2] B07B *1/02*

U.S. Cl. 209—235 12 Claims



1. A method of excavating an archaeological site having a plurality of levels by using an archaeological sifting basket having a bottom wall which bottom wall has a front and rear planar area arranged at an angle to each other comprising placing said archaeological basket on a relatively lower level with said basket resting stably upon said rear planar area, brushing material to be sifted from a relatively higher area into said basket thereby lowering the said relatively upper level to an intermediate level above said relatively lower level, subsequently resting said archaeological sifting basket on said relatively lower level with said basket resting upon said front planar area, brushing material to be sifted from said intermediate level into said basket, and sifting the material brushed into said basket.

4,162,968

SCREEN APPARATUS FOR SORTING FRAGMENTED MATERIAL

Derald B. Gellhaus, Yankton, S. Dak., assignor to Kolberg Manufacturing Corporation, Yankton, S. Dak.

Filed Mar. 16, 1978, Ser. No. 887,026

Int. Cl.[2] B07B *1/48*

U.S. Cl. 209—400 4 Claims

1. A screen apparatus for sorting fragmented material comprising:

a substantially rigid, rectangular screen box frame having first and second ends and including first and second longitudinal side walls and support means fixed to and positioned between said side walls of said frame;

a plurality of elongated, wire spacing members, a said member being removably mounted to said support means, and each said member having a mounting surface confronting and engaging said support means and each said member having an arcuate, generally convex face oriented upwardly and away from said support means;

each of said elongated members having therealong a multiplicity of generally parallel guideways equally spaced from one another at a predetermined distance of separation and aligned parallel to said longitudinal side walls, the said guideways of each said member being longitudinally aligned with corresponding guideways of the remaining said members to define a multiplicity of straight line paths extending between said ends;

wire retention means adjacent said first and second ends of said frame;

a multiplicity of screen wire lengths extending longitudinally over said frame along a multiplicity of said straight line paths between said first and second ends and retained by said wire retention means, each said wire length being confined in a plurality of longitudinally aligned guideways of said elongated members to thereby maintain said predetermined distance of separation between adjacent wire lengths;

each of said elongated members comprising a metal strip having a substantially arcuate outer periphery;

each of said guideways having a substantially V-shaped cross section so as to closely confine a said wire length having any of a predetermined range of diameters;

each said guideway having an arcuate, generally convex floor; and

said floor of each said guideway intersecting said outer periphery of each said elongated strip at a location spaced downwardly from said wire length passing through said guideway to thereby substantially eliminate destructive rubbing of the wire length against the intersection of said floor of said guideway and said face.

4,162,969

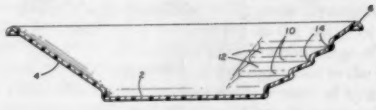
APPARATUS FOR SEPARATING MATERIAL BY SPECIFIC GRAVITY

Roy Lagal, 2416½ E. Main, Lewiston, Id. 83501, assignor to Roy Lagal, Lewiston, Id.

Filed Jul. 8, 1977, Ser. No. 813,957

Int. Cl.[2] B03B *5/02*

U.S. Cl. 209—447 10 Claims



9. In an apparatus for separation according to specific gravity of particulate materials which are carried by a fluid comprising a circular flat bottom surface, a truncated conical surface extending outward therefrom and concentric stepped indentations comprising a first surface substantially perpendic-

ular to the conical surface and a second surface joined to the first surface and extending from the point of juncture to points lying in the plane of the conical surface, the improvement comprising an angle of 90° between the first and second surfaces the point of juncture of such surfaces having a typical radius of substantially zero.

4,162,970

INJECTORS AND THEIR USE IN GASSING LIQUIDS

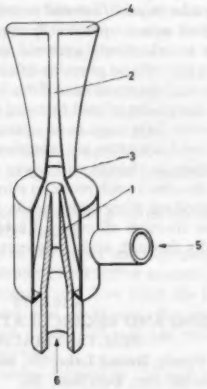
Marko Zlokarnik, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,893

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634494

Int. Cl.² C02B *3/08*; C02C *1/12*

U.S. Cl. 210—15 **5 Claims**



1. In a process for intensifying mass transfer in a gas-liquid system by contacting a gas with a liquid utilizing the energy of a propulsion jet to produce very fine gas bubbles, the improvement which comprises passing a liquid through an injector comprising a propulsion jet nozzle, a housing thereabout and a mixing chamber communicating with said housing, said nozzle including a liquid inlet and a throat outlet directed toward the mixing chamber, said housing including a gas inlet, said mixing chamber communicating with said inlets and itself having a round inlet and a substantially slit-shaped outlet of about 5 to 25 times the cross-sectional area of the throat outlet, intimately contacting the gas with a liquid in the mixing chamber, the liquid velocity in the said chamber ranging from 5 to 30 meters per second, the ratio of the gas throughput in m_N^3 per hour to the propulsion jet throughput in m^3 per hour ranging from about 1:1 to about 20:1.

4,162,971

INJECTORS WITH DEFLECTORS FOR THEIR USE IN GASSING LIQUIDS

Marko Zlokarnik, Cologne, and Klaus Elgeti, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,894

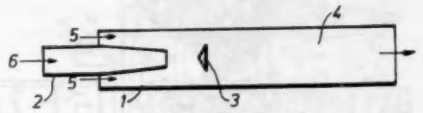
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634496

Int. Cl.² C02B *3/08*; C02C *1/12*

U.S. Cl. 210—15 **15 Claims**

1. In an injector for the dispersion of a gas into a liquid and comprising a gas inlet, a liquid inlet, and a mixing chamber communicating with said inlets and itself having an inlet and at least one outlet, the improvement which comprises positioning said liquid inlet axially of the mixing chamber, positioning said gas inlet upstream of the mixing chamber so as to provide a gas stream surrounding the liquid stream with both streams aimed in the same direction, and providing one deflecting element disposed in the mixing chamber along the axis of the liquid inlet, whereby the liquid is distributed across the full cross-section of the mixing chamber.

12. In a process for intensifying mass transfer in a gas-liquid system by causing a gaseous medium to make contact with a liquid medium utilizing the energy of a propulsion jet for producing very fine gas bubbles, the improvement which comprises impinging the liquid medium at a velocity of between about 5 to 30 meters per second against a deflecting



surface so as to bring the liquid into intimate contact with gas in at least one subsequent mixing chamber which tapers continuously, the gas throughput in m_N^3 per hour being about 2 to 20 times the throughput of the propulsion jet in m^3 per hour, the liquid and gas being introduced through an injector which houses the mixing chamber, the injector being provided with a liquid inlet axially of the mixing chamber, a gas inlet positioned upstream of the mixing chamber so as to provide a gas stream surrounding the liquid stream with both streams aimed in the same direction, and a deflecting element disposed axially in the mixing chamber and against which the liquid jet impinges.

4,162,972

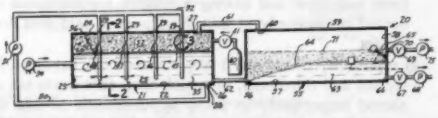
ENCLOSED FLOTATION DEVICE

Gerald G. Green, 6868 Los Verdes Dr., Palos Verdes, Calif. 90274

Continuation of Ser. No. 792,099, Apr. 29, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,640

Int. Cl.² B03D *1/24*; B01F *3/04*

U.S. Cl. 210—44 **16 Claims**



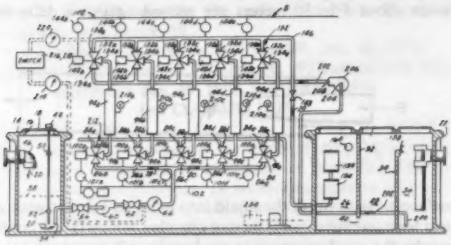
1. A process for clarifying by flocculation a turbid liquid which forms a foam with injected gas, and which contains material which, with gas, will form a floatable floc, said process comprising: in an injection vessel, on a continuous basis injecting into a body of said liquid a gas compatible with said liquid, whereby to form a foam atop the body of liquid and to form components of floc within said body of liquid; retaining said foam in said injection vessel in such manner as to prevent its escape; continuously and for a substantial period of time reinjecting into said body of liquid such of said gas which escapes said body of liquid and at least some of said foam, whereby substantially to eliminate loss of liquid in the form of foam; thereafter on a continuous basis transferring liquid from said body of liquid to a closed flocculation vessel wherein said liquid is quietly contained, whereby to form a three phase system comprising liquid at the bottom, high solid floc atop the liquid and froth-gas atop the floc, and on a continuous basis withdrawing liquid and floc from levels where their respective phase exists.

4,162,973

WATER POLISHING SYSTEM

William M. Lynch, Glen Ellyn, Ill., assignor to AFL Industries, Inc., West Chicago, Ill.

Filed Jun. 2, 1977, Ser. No. 802,814
Int. Cl.[2] B01D *21/24, 29/36, 29/38, 35/12*
U.S. Cl. 210—73 W **18 Claims**



1. A modular water polishing system for removing suspended solids and emulsified oils from a flow of waste water comprising,

(a) a self-contained transportable support structure including a support platform,

(b) a first, surge tank mounted on said platform and having supply means for charging a substantially continuous source of said waste water into the surge tank,

(c) a second, coalescing and outlet tank carried by said platform and separated from said surge tank and connected to an outlet from said system,

(d) pumping means carried by said support structure for pumping said waste water through an inlet communicating with said surge tank,

(e) a plurality of first 3-way valves each having a first, second and third port, said first ports of said valves connected respectively in parallel to an output of said pumping means, said first 3-way valves having an operative flow path between said first port and said third port, and a backwash flow path between said third port and said second port,

(f) a plurality of filter units mounted on said support structure outside of said tanks to remove said suspended solids from said flow and having a bottom appurtenance connected respectively to said third port of said first 3-way valves,

(g) a plurality of second 3-way valves each having a first, second and third port, of which their first ports are connected respectively to a top appurtenance of said filter units, said second 3-way valves having an operative flow path between their first port and third port and a backwash flow path between their second port and their first port,

(h) a plurality of coalescers to separate said suspended oils from said flow, and mounted in said second coalescing and outlet tank and communicating jointly with said third ports of said second 3-way valves,

(i) oil accumulation means for collecting coalesced oils comprising a first widthwise partition mounted in said second tank and having a bottom edge spaced above the bottom of such tank to provide a submerged outlet for said flow of waste water, and a second widthwise partition mounted in said second tank spaced from said first partition and having a top horizontal edge to provide an overflow weir for said waste water flow into a clean water chamber separated from the remainder of the second tank by said second partition, said top edge selectively positioned to maintain a liquid level in said second tank to maintain said coalescers in a submerged condition within said second tank,

(j) backwashing means to remove separated solids from said filter units, said backwashing means including,

an intake in said clean water chamber connecting to a backwash pump,

a first backwash line communicating an outlet of said backwash pump in parallel to said second ports of said second 3-way valves, respectively, and

a second backwash line connecting in parallel said second port of said first 3-way valves,

(k) actuating means comprising a first set of actuators carried by and operatively connected to said first 3-way valves for selectively opening and closing said operative and backwash flow paths in said first and second valves,

(l) said actuating means comprising a second set of actuators carried by and operatively connected to said second 3-way valves cooperating with said first set of actuators to selectively open and close said operative and backwash flow paths in said first and second valves,

(m) control means operatively connected to said actuating means to selectively activate said actuating means and place a part of said plurality of said first and second 3-way valves and the associated filter unit in a backwash mode and a remainder of said first and second 3-way valves and associated filter units in an operative mode,

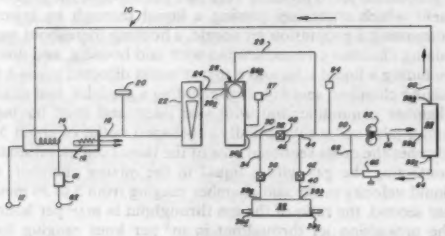
wherein said actuators are selectively operated by said control means to change said 3-way valves from an operative mode to a backwash mode to allow selective backwashing of individual filter units while the system continues to operate through all other of said filter units and uninterruptedly through said coalescers.

4,162,974

DEAIRING AND RECIRCULATION SYSTEMS FOR DIALYSIS MACHINES

Stanley J. Pernic, Round Lake, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 15, 1977, Ser. No. 787,753
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—120 **8 Claims**



7. A dialysis machine for drawing dialysis solution through a dialyzer under a negative pressure and for removing dissolved and entrained gases from the dialysis solution prior to delivery to the dialyzer, said machine comprising:

(A) selectively adjustable flow control valve means for controlling the volume of fresh dialysis solution flowing therethrough,

(B) deairing tank means downstream of said valve means for receiving dialysis solution from said valve means, said deairing tank means including dialysis solution inlet means through which dialysis solution enters said deairing tank means, gas outlet means and deaerated dialysis solution outlet means associated with said dialyzer,

(C) substantially constant speed and constant volume suction pump means operatively associated with said deairing tank means and positioned downstream of and connected to said dialyzer for applying a negative pressure thereto and operatively associated with said gas outlet means and said dialysis solution outlet means for drawing deaerated dialysis solution from said deairing tank means through

the dialyzer to said pump means, and for drawing gas from said deairing tank means to said pump means,

(D) air separation and holding tank means, positioned downstream of said pump means, for receiving said gas and spent-dialysis solution, said separation tank means having an inlet, a drain outlet adjacent the top of the separation tank means and a recirculation outlet adjacent the bottom of the separation tank means, and said separation tank means being shaped and constructed so as to permit gas and gas-containing spent-dialysis solution to exit said separation tank means through said drain outlet and to permit spent-dialysis solution with a lesser gas content to be drawn from said separation tank means through said recirculation outlet; and

(E) negative pressure control valve means, positioned downstream of the separation tank means, for adjusting negative pressure in a dialyzer and cooperatively associated with said recirculation outlet and the upstream side of said pump means so that spent-dialysis solution having a lesser gas content is drawn from said recirculation tank means through said control valve means to said pump means;

wherein said deairing tank means is elongated and adapted to be positioned in an upright attitude and has:

(i) a hollow, elongated and tubular casing,

(ii) end cap means for closing each end of said casing,

(iii) said dialysis solution inlet means adjacent the upper end of the casing,

(iv) said deaerated dialysis solution outlet means adjacent the lower end of the casing,

(v) said outlet means in the upper end cap means, and

(vi) an internal baffle-and-check valve assembly for closing the gas outlet means from flow when the liquid level reaches a predetermined level and for assuring the proper opening and closing of said gas outlet means, said assembly comprising:

(a) tubular baffle means secured at one end to said end cap means, surrounding said gas outlet means and being spaced from said casing, said baffle means extending from said cap means and terminating in an open end, which is positioned between said dialysis solution inlet means and said deaerated dialysis solution outlet means;

(b) ball-valve means positioned within said baffle means for sealingly engaging said gas outlet means,

(c) means retaining said ball-valve means in said baffle means between said gas outlet means and said other end of said baffle means; and

(d) said assembly being constructed so that incoming dialysis solution will flow against said baffle means and prevent direct flow against said ball-valve means.

4,162,975

HIGH VELOCITY COMPOSITE STRAINER

Ralph C. Adams, Somers Point; Arthur C. Epstein, Hamilton Square, both of N.J.; William J. Maroney, Williston Park, N.Y., and Albert B. Mindler, Princeton, N.J., assignors to Permutit Company, Inc., Paramus, N.J.

Filed Feb. 7, 1978, Ser. No. 875,911

Int. Cl.² B01D *25/02, 25/32*

U.S. Cl. 210—124 **23 Claims**

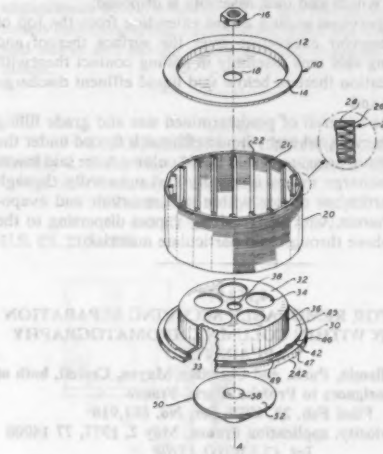
16. A high velocity composite strainer for use in a fluid environment containing particulate matter comprising:

(a) a high volume low velocity strainer unit having openings between the interior and exterior portions thereof;

(b) a low volume high velocity closeable separator unit having an inner and an outer peripheral surface and at least one row of peripheral openings communicating between said outer and said inner surfaces;

(c) means for providing for fluid flow between the interior portion of said high volume low velocity strainer unit and said low volume high velocity separator unit;

(d) means for interrupting fluid flow between the interior of said high volume low velocity strainer unit and said low volume high velocity separator unit, while permitting the



flow into the interior of said low volume high velocity unit and out of the peripheral openings therein.

4,162,976

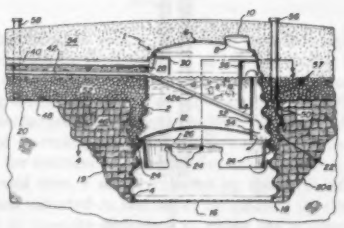
SEWAGE DISPOSAL SYSTEM

Arnold A. Monson, 6516 Zane Ave., Apt. 204, Minneapolis, Minn. 55429

Filed May 30, 1978, Ser. No. 910,867

Int. Cl.² B01D *1/00, 21/10, 21/24;* **C02C** *1/16*

U.S. Cl. 210—170 **17 Claims**



1. A waste treatment system comprising:

a tank assembly comprising an upper tank unit having sewage inlet means and a lower tank unit disposed below said upper tank unit, said upper and lower tank units having sidewalls, with said upper tank unit having a top wall and said lower tank unit having a bottom wall, a dividing wall between said tank units, and said lower tank unit being connected in fluid flow communication with said upper tank unit, whereby sewage is initially reduced in first and second stages of anaerobic digestion in said upper and lower tank units;

baffle means extending vertically within said upper tank unit to a predetermined liquid level therein and having a bottom, outlet end in fluid flow communication with said lower tank unit, said baffle means defining a generally vertically extending flow passage through which liquid flows from said upper tank unit into said lower tank unit and within which a column of liquid is maintained to exert hydrostatic pressure on liquid within said lower tank unit;

liquid effluent discharge means in said lower tank unit opening into the space around said lower tank unit;

a dispersion reservoir surrounding said tank assembly, said

reservoir comprising an excavation in the ground of predetermined area and depth around said tank assembly within which said tank assembly is disposed;

liquid impervious sealing means extending from the top of said reservoir excavation over the surface thereof and engaging said tank assembly in sealing contact therewith at a location thereon below said liquid effluent discharge means; and

particulate material of predetermined size and grade filling said reservoir, whereby liquid effluent is forced under the hydrostatic pressure of said liquid column from said lower unit discharge means upwardly and outwardly through said particulate matter within said reservoir and evaporates therein, with the resulting vapors dispersing to the atmosphere through said particulate material.

4,162,977

MEANS FOR REMOVABLY SECURING SEPARATION COLUMN WITHIN COLUMN CHROMATOGRAPHY APPARATUS

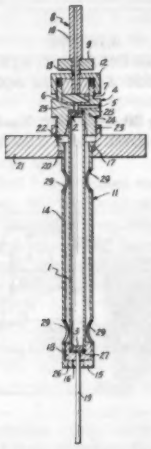
Claude Guillemin, Paris, and Christian Mayen, Creteil, both of France, assignors to Prolabo, Paris, France

Filed Feb. 28, 1978, Ser. No. 881,916

Claims priority, application France, May 2, 1977, 77 14000

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—198 C **8 Claims**



1. In chromatography apparatus including a dispensing head, a device for removably securing chromatography separation column means in operative relationship to said dispensing head, said device including:

a generally tubular engagement column adapted to receive and carry said separation column means, and including means at one end thereof defining a first bearing surface arranged to be engageable with one axial end of separation column means carried thereby;

means for removably connecting the other end of said engagement column with said dispensing head, said dispensing head having a second bearing surface thereon arranged to confront the other axial end of separation column means carried by said engagement column when said engagement column is connected with said dispensing head; and

adjustable means for applying a selected, substantially axial compressive stress to separation column means carried by said engagement column when the other end of said engagement column is connected with said dispensing head, said stress being applied through said engagement column and said first and said second bearing surfaces, whereby to secure said separation column means carried by said engagement column in operative relationship with said dispensing head.

4,162,978

SEPARATOR

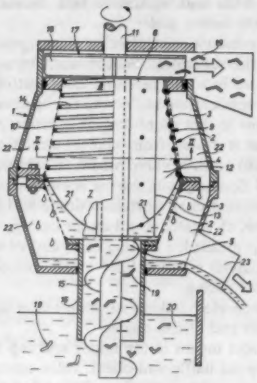
Sten M. Lidman, Tumba, Sweden, and Engelbert Baum, Vienna, Austria, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Sep. 15, 1978, Ser. No. 942,789

Claims priority, application Sweden, Sep. 19, 1977, 7410444

Int. Cl.[2] B01D *29/36*

U.S. Cl. 210—213 **8 Claims**



1. In a separator for separating solid constituents from a mixture of liquid and solids, the combination of means forming a chamber defined substantially by a surface of revolution, the chamber having a central axis and being provided at one end with an inlet for supplying the mixture to a first part of the chamber, the peripheral wall of the chamber being perforated for draining liquid from the chamber, the other end of the chamber having an outlet for discharging solid constituents from a second part of the chamber, a rotor mounted in the chamber for rotation around said central axis, guide means having turns extending helically along said peripheral wall and forming therewith a helical path for leading solid constituents toward said outlet, and carrier means on the rotor for engaging mixture from said inlet and causing the mixture to rotate along said perforated peripheral wall, there being a passage allowing ambient gaseous medium to enter the chamber so that the rotor's action on the mixture maintains a free liquid surface in said first part of the chamber, the carrier means and rotor coacting with the guide means to carry a liquid-bearing cake of the solid constituents through said free liquid surface and thence through said second part of the chamber to said outlet, during draining of said cake.

4,162,979

DEVICE FOR THE CHEMICAL AND/OR PHYSICAL TREATMENT OF LIQUIDS

August W. Wahlefeld; Siegfried Looser, both of Weilheim, and Klaus A. Sturmann, Oberalting-Seefeld, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Oct. 18, 1977, Ser. No. 843,299

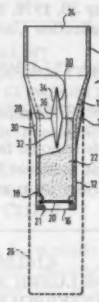
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 7636679

Int. Cl.[2] B01D *27/02*

U.S. Cl. 210—282 **11 Claims**

10. A device for the treatment of liquids, comprising a flow-through vessel having an inlet and an outlet and containing therein a treatment agent between the inlet and the outlet, the flowthrough vessel comprising a substantially cylindrical tube having one end at the outlet and a conically widening tube

section connected to the other end of said cylindrical tube and integral therewith, bearing members disposed in the transitional region between the cylindrical tube and the conical tube section, on the outer side thereof for bearing on the upper edge of a collection vessel receptive of the cylindrical tube said



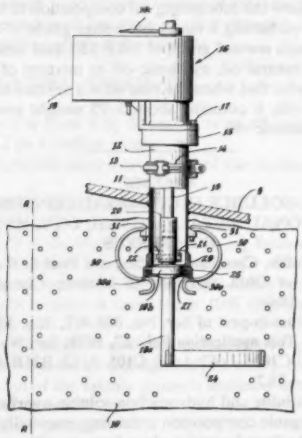
bearing members comprising roof-shaped outwardly extending ribs, each of which forms, with the cylindrical tube and the conical section, an acute-angled triangular member, and having gable lines bridging the hollow throat in the transition region between the cylindrical tube and the conical tube section.

4,162,980

LOAD INDICATOR FOR CENTRIFUGES

Bradley I. Berit, New Paltz, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Jun. 2, 1978, Ser. No. 912,026
Int. Cl.[2] B01D *33/10*
U.S. Cl. 210—360 R **8 Claims**



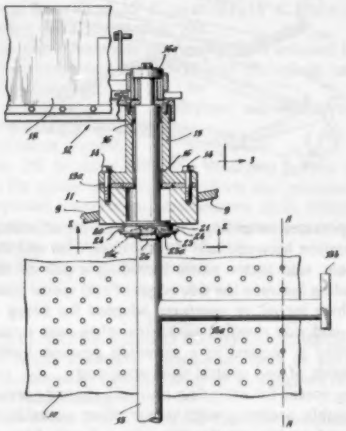
1. In combination with a centrifugal basket mounted for rotation about a vertical axis and adapted to receive a mixture of liquid and solids to be centrifuged, and a stationary frame cover overlying the basket, a load indicator comprising a sleeve extending through a hole in said cover and secured thereto, a generally vertical shaft mounted for rotation in the sleeve and projecting through the lower end thereof into the basket, a paddle secured to the lower portion of said shaft and engageable with the inner surface of an annular mass of solids being centrifuged in the basket, indicating means overlying said cover and including mechanism operable by the paddle through said shaft to indicate changes in the position of said inner surface relative to said axis, sealing means surrounding the shaft in sealing engagement therewith below said sleeve, and releasable means clamping said sealing means in sealing engagement with the lower end of said sleeve, said releasable means including spring clips having upper portions secured to said sleeve and having lower portions engaging said sealing means.

4,162,981

DISCHARGER FOR CENTRIFUGES

Bradley I. Berit, New Paltz, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Jun. 2, 1978, Ser. No. 912,027
Int. Cl.[2] B01D *33/10, 35/16*
U.S. Cl. 210—375 **5 Claims**



1. In combination with a centrifugal separator including a basket mounted for rotation about an axis and having an annular wall surrounding said axis, and a stationary frame cover overlying the basket, said cover having a hole offset from said axis, a discharger comprising a hollow boss secured to said cover and extending downwardly through said hole, a shaft mounted for rotation in said boss and extending downwardly through said boss, a scraper carried by the shaft below said boss, means mounted on said cover for rotating the shaft intermittently in opposite directions to swing the scraper toward and away from said annular wall, thereby scraping deposited material from the interior of said wall as the basket rotates, a collar surrounding the shaft below said boss and having annular means in sealing engagement with the shaft and with said boss, and releasable means for urging the collar upwardly into sealing engagement with said boss, said collar having a downwardly tapering outer wall, said releasable means including a generally U-shaped clip having legs which straddle said collar, and means depending from said boss for releasably retaining the clip with its legs pressed against said downwardly tapering wall.

4,162,982

VACUUM FILTER SEGMENT WITH REPLACEABLE SECTOR PLATES

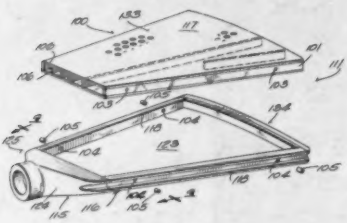
Ray J. Chesner, Brookfield, Wis., assignor to American Scanmec, Inc., Brookfield, Wis.

Filed Sep. 6, 1977, Ser. No. 830,863
Int. Cl.[2] B01D *33/26*
U.S. Cl. 210—486 **5 Claims**

1. A vacuum filter segment comprising, in combination,
a generally sector-shaped frame including a generally sector-shaped frame member partially defining a generally sec-

tor-shaped central open area and wall means secured to said frame member for defining a throat which communicates with said sector-shaped central open area and which is adapted for sealing engagement with a vacuum manifold, said frame member and said wall means defining the perimeter of said central open area, said frame member including a pair of side members secured to said wall means and extending on opposite sides of said central open area, said side members each including at least one aperture extending transversely therethrough,

a unitary sector plate assembly including a pair of sector plates adapted for supporting a filter medium and includ-



ing apertures extending therethrough for affording communication between said central open area and the filter medium, said sector plates including a pair of side bars extending between the side edges of said sector plates, said side bars including apertures adapted for being aligned with said side member apertures when said sector plate assembly is located in a mounted position within said perimeter of said central open area, and

fastening means for extending into said aligned apertures for removably securing said sector plate assembly in said mounted position without requiring integral bonding or welding of said fastening means to said sector-shaped frame.

4,162,983

FABRIC CARE COMPOSITION CONTAINING STARCH AND SURFACTANT

Samuel M. Johnson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,925

Int. Cl.[2] D06M *13/00*

U.S. Cl. 252—8.6 **11 Claims**

1. A liquid fabric care composition suitable for restoring body to fabrics comprising:

(a) from about 1% to about 25% of a gelatinized and stabilized vegetable starch prepared by exposing a water dispersion of a gelatinized vegetable starch to a pH of from about 10 to about 13 to stabilize said starch and thereafter neutralizing any excess alkali to provide a pH of from about 4 to about 9;

(b) from about 5% to about 50% of a surface-active detergent selected from the group consisting of anionic, nonionic, zwitterionic and amphoteric surface-active detergents and mixtures thereof;

(c) up to about 20% of an electrolyte;

(d) from about 25% to about 94% water, said composition having a pH of from about 4 to about 11.

4,162,984

TEXTILE TREATMENT COMPOSITIONS

Frans DeBlock, Merchtem; Pierre C. E. Goffinet, and Fleming Sorensen, both of Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 30, 1978, Ser. No. 910,914

Claims priority, application United Kingdom, May 30, 1977, 22740/77

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.8 **9 Claims**

1. A textile treatment composition in the form of an aqueous dispersion and comprising

(a) a water-insoluble cationic fabric softener;

(b) a water-insoluble nonionic fabric softener; and

(c) from 0.1% to 10% of an aromatic mono- or di-carboxylic acid.

4,162,985

MULTIGRADE LUBRICANTS CONTAINING INTERPOLYMERS

Zenowie M. Holubec, Parma Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 402,230, Oct. 1, 1973, abandoned. This application Oct. 6, 1977, Ser. No. 839,957

Int. Cl.[2] C10M *1/48, 3/42, 1/16, 3/10*

U.S. Cl. 252—32.7 E **23 Claims**

1. A shear stable multigraded gear oil composition comprising (A) at least about 30 weight percent of a base oil having a viscosity of about 40–2000 SUS at 100° F., (B) at least one extreme pressure agent in an amount sufficient to impart extreme pressure properties thereto, and (C) at least about 5 weight percent of at least one oil-soluble interpolymer, said interpolymer being a hydrogenated interpolymer of at least one monovinyl-arene or substituted monovinyl-arene and of at least one C_{4-6} conjugated diene and/or at least one C_{3-6} alpha-olefin, said polymer having a number average molecular weight of about 750–10,000 and being present in an amount such as to allow the lubricating oil composition to be a multigraded gear oil having a minimum winter grade of SAE 75W and a maximum normal grade of SAE 250, said base oil being at least one natural oil, synthetic oil or mixture of same and with the proviso that when the base oil is a mixture of synthetic and natural oils, it contains about 5–95 weight percent of at least one synthetic oil.

4,162,986

OIL-SOLUBLE HIGH METAL CONTENT TRANSITIONAL METAL ORGANIC OXY, HYDROXY, COMPLEXES

Anthony Alkaitis, Cleveland Heights, and Paul L. Cells, Cleveland, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 808,407, Jun. 20, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,363

Int. Cl.[2] C10M *1/40, 1/24;* C10L *1/32;* B21B *45/02*

U.S. Cl. 252—33.2 **30 Claims**

1. An oil-soluble and hydrocarbon-soluble overbased transition metal organic composition consisting essentially of a metal oxide and a hydroxyl-metal-carboxylate or -sulfonate complex wherein the metal content which comprises at least one metal which is a transitional metal is in chemical combination partly with oxygen in a polynuclear metal oxide crystallite core and partly with at least two different aliphatic or alicyclic monocarboxylic acids or a mixture of one or more aliphatic or alicyclic monocarboxylic and aliphatic or aromatic monosulfonic acids containing at least two carbon atoms as hydroxyl-metal-carboxylate and hydroxy-metal-sulfonate groups, at least one of the acids being a monocarboxylic acid containing at least seven carbon atoms, and when the second acid is also a monocarboxylic acid, the second acid contains a number of carbon atoms in its longest chain differing by at least two carbon atoms from the total number of carbon atoms in the other, at least a

portion of the carboxylate and sulfonate groups being hydrogen bonded to oxygen atoms of the core, and the remainder of the carboxylate and sulfonate groups are unbonded and in equilibrium with the bonded groups, and the ratio of total metal moles to the total moles of organic acid is greater than one.

4,162,987

ENZYME-CONTAINING AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Edward J. Maguire, Jr., and Eugene J. Pancheri, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 699,416, Jun. 24, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,881

Int. Cl.[2] C11D *3/37*

U.S. Cl. 252—135 **9 Claims**

1. A cleaning composition, particularly suitable for use in automatic dishwashers, consisting essentially of:

(a) from about 0.5% to about 20% of an alkoxylated nonionic surface-active agent selected from the group consisting of:

(i) the condensation product of one mole of a carboxylic acid having from about 10 to about 18 carbon atoms with from about 5 to about 50 moles of ethylene oxide;

(ii) the condensation product of an alcohol having from about 10 to about 24 carbon atoms with from about 5 to about 50 mols of ethylene oxide;

(iii) polyethylene glycol having a molecular weight of from about 1400 to about 30,000;

(iv) the condensation product of one mole of alkyl phenol wherein the alkyl chain contains from about 8 to about 18 carbon atoms with from about 4 to about 50 moles of ethylene oxide;

(v) the condensation product of benzyl chloride and an ethoxylated alkyl phenol wherein the alkyl group has from about 6 to about 12 carbon atoms and wherein from about 12 to about 20 moles of ethylene oxide have been condensed per mole of alkyl phenol;

(vi) polyetheresters of the formula

$$(ClC_6H_4)_2\ CHCO_2\ (CH_2.CH_2.O)_xR$$

wherein x is from 4 to 20 and R is an alkyl group with from 1 to 4 carbon atoms;

(vii) polyoxyalkylene compounds of the formula

$$Y[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein Y is an organic radical having from about 1 to about 18 carbon atoms and containing x reactive hydrogen atoms and the values of n and m are such that the (C_2H_4O) content is from about 10% to about 90% by weight

(viii) the alkoxylated nonionic surface-active agents having the formula (i) through (vii) in which the terminal hydroxyl of the alkoxy group is acylated with a monobasic acid; and

(ix) mixtures thereof

(b) from about 0.001% to about 5% of an enzyme mixture which consists essentially of:

(i) a proteolytic enzyme having a proteolytic activity of 80% to 100% of maximum activity when measured at pH 12 using the Anson Hemoglobin method carried out in the presence of urea; and

(ii) an amylolytic enzyme which exhibits an amylolytic activity of greater than 50% of maximum when measured at pH 8 by the SKB method at 37° C.,

wherein said enzymes are present in a ratio of from about 4:1 to about 1:4 by weight, and wherein said enzyme mixture is present in such an amount that the final cleaning composition has an amylolytic activity of at least 150 Kilo Novo units per kilogram and a proteolytic activity of at least 6.0 Anson units per kilogram;

(c) from 0% to about 5% of a suds-regulating agent selected from the group consisting of:

(i) a siloxane having the formula:

wherein x is from about 20 to about 2,000 and R and R′ are each alkyl or aryl groups selected from the group consisting of methyl, ethyl, propyl, butyl and phenyl;

(ii) A microcrystalline wax having a melting point in the range from about 35° C. to about 115° C. and a saponification value of less than 100;

(iii) an alkyl phosphate ester component selected from the group consisting of stearyl acid phosphate and oleyl acid phosphate;

(iv) a siloxane/glycol copolymer self-emulsifying suds suppressor; and

(v) mixtures thereof;

(d) from 0% to about 60% of a detergent builder selected from the group consisting of sodium and potassium polyphosphates, carbonates, bicarbonates, alkali silicates, polyacetates, carboxylates, polycarboxylates, polyhydroxysulfonates and mixtures thereof; and

(e) from 0% to about 20% water.

4,162,988

BIPHENYL ESTER LIQUID CRYSTAL COMPOUNDS

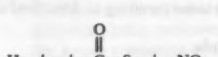
Robert C. Maze; Everett P. Oppenheim, both of Tempe, and Reese M. Reynolds, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 707,479, Jul. 21, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,623

Int. Cl.[2] C07C *143/68;* C09K *3/34*

U.S. Cl. 252—299 **2 Claims**

1. A compound having the formula



wherein ϕ represents a benzene ring and wherein the designated groups are substituted at the para ring position.

2. An improved liquid crystal composition comprising a substantially eutectic mixture of two or more phenylbenzoate ester liquid crystal compounds selected from the group consisting of $C_2H_5—\phi—CO_2—\phi—CN$, $C_4H_9—\phi—CO_2—\phi—CN$, $C_5H_{11}—\phi—CO_2—\phi—CN$, and $CH_3O—\phi—CO_2—\phi—C_5H_{11}$, wherein the improvement comprises the addition to said mixture of a compound having the formula of claim 1.

4,162,989

OIL-IN-WATER EMULSION

Kenoth H. Flournoy, Levelland; Ricardo L. Cardenas, and Joseph T. Carlin, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 664,712, Mar. 8, 1976, Pat. No. 4,108,193. This application Aug. 24, 1977, Ser. No. 827,296

Int. Cl.[2] F17D *1/17;* B01J *13/00*

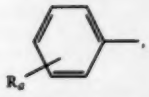
U.S. Cl. 252—312 **4 Claims**

1. An oil-in-water emulsion comprising a hydrocarbon phase and as the aqueous phase about 10 percent to about 40 percent by volume based on the volume of the hydrocarbon of an aqueous solution comprising from about 0.01 to about 2.0 weight percent of an anionic surfactant selected from the group consisting of:

(A) compounds of the formula:

$$RO(CH_2CH_2O)_gSO_3M$$

wherein R is selected from the group consisting of alkyl of from 8 to 25 carbon atoms and

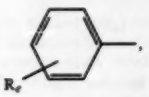


wherein R_a is alkyl of from 8 to 20 carbon atoms, g is an integer of from 1 to about 20 and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and the ammonium ion;

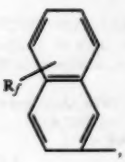
(B) sulfonates of the formula:

$$R_dO(CH_2CH_2O)_hCH_2CH_2SO_3M,$$

wherein R_d is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_e is alkyl of from 8 to 20 carbon atoms and

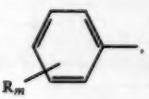


wherein R_f is alkyl of from 1 to 10 carbon atoms; h is an integer of from 1 to 24 and M has the same meaning as described above in (A);

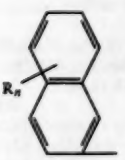
(C) sulfonates of the formula:

$$R_kO(C_2H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_tCH_2CH\text{-}{}_2SO_3M,$$

wherein R_k is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_m is alkyl of from 8 to 20 carbon atoms, and



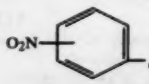
wherein R_n is alkyl of from 1 to 10 carbon atoms; r is an integer of from 1 to about 18; s is an integer of from 1 to about 12, t is an integer of from 1 to about 20, and the sum of r+s+t is not more than 30, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M has the same meaning as described in (A) above; and

(D) mixtures of the above described surfactants; from about 0.01 to about 1.0 weight percent of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof and from about 0.01 to about 0.50 weight percent of a material selected from the group consisting of (1) a guanidine salt, (2) an oxyalkylated nitrogen-containing aromatic compound having the formula:

$$R_y(OR_w)_xOH,$$

wherein R_y is selected from the group consisting of:

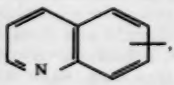
(a)



(b)

and

(c)



wherein R_w is alkylene of from 2 to 4 inclusive carbon atoms and x is an integer of from about 5 to about 50 and (3) mixture of (1) and (2) above.

4,162,990

METHOD AND COMPOSITION FOR RETARDING WATER EVAPORATION

John J. Rowlette, Arcadia, Calif., assignor to Duane D. Erway, South Pasadena, Calif., a part interest

Filed Feb. 22, 1974, Ser. No. 444,827

Int. Cl.[2] B01J *1/18*

U.S. Cl. 252—383 **18 Claims**

1. A water evaporation retardant consisting essentially of a mixture of a saturated aliphatic interface-active hydrocarbon in solution with a spreading agent that is soluble in both water and the hydrocarbon, the mixture having a sufficiently small specific gravity to float on water.

4,162,991

RECOVERING COBALT AND BROMIDE CATALYST VALUES USING A STRONG ANION EXCHANGE RESIN

Peter J. V. Jones, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 3, 1978, Ser. No. 883,309

Claims priority, application United Kingdom, Apr. 25, 1977, 17130/77

Int. Cl.[2] B01J *23/94, 27/32;* C01G *51/00;* C07C *51/33*

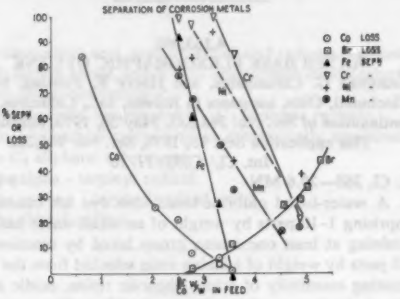
U.S. Cl. 252—413 **10 Claims**

1. A process for recovering cobalt catalyst values from the reaction mother liquor resulting from the oxidation in the liquid phase to a mono or polycarboxylic acid of a feedstock oxidisable thereto by means of a molecular oxygen-containing gas in presence of a lower aliphatic monocarboxylic acid and of a catalyst comprising cobalt and bromide ions followed by separation of the said mono or polycarboxylic acid from the said reaction mother liquor, which process comprises,

(1) providing in the said reaction a mother liquor having a cobalt concentration from 0.1% to 10% by weight of cobalt in said lower aliphatic monocarboxylic acid, and,

having the bromide concentration so that the ratio of bromide to cobalt is from 1.5:1 to 4.5:1 by weight,

(2) contacting the resulting solution containing cobalt and bromide ions with a strongly basic anion exchange resin



whereby cobalt and bromide values are adsorbed on said resin, and

(3) eluting cobalt and bromide values from said anion exchange resin with lower aliphatic monocarboxylic acid containing more than 10% by weight of water.

4,162,992

OXIDATION AND AMMOXIDATION CATALYSTS

Kenneth V. Wise, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1978, Ser. No. 866,596

Int. Cl.[2] B01J *29/16, 23/16;* **C07C** *51/24, 120/02*

U.S. Cl. 252—456 **9 Claims**

1. A catalyst for oxidation and ammoxidation of hydrocarbons consisting essentially of catalytic components having the empirical formula

$$Sb_aV_bTi_cO_x$$

wherein a is at least 6, b is 1, and c is a number such that the ratio of c/a is at least 0.5, and x is a number taken to satisfy the valence requirements of the metal ions present.

4,162,993

METAL CATALYST SUPPORT

William B. Retallick, West Chester, Pa., assignor to Oxy-Catalyst, Inc., West Chester, Pa.

Filed Apr. 6, 1978, Ser. No. 894,180

Int. Cl.[2] B01J *35/02*

U.S. Cl. 252—477 R **5 Claims**

1. A spiral formed by winding a strip of metal upon itself;

(a) said strip having indentations of uniform height so that the spacing between layers of the spiral is equal to this height,

(b) said indentations being spaced along the strip in a pattern that varies and is not repeated in any layer of the spiral, so that the indentations in successive layers cannot coincide and nest together.

4,162,994

POWDERED DETERGENT COMPOSITIONS CONTAINING A CALCIUM SALT OF AN ANIONIC SURFACTANT

John Kowalchuk, Palisades Park, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,320

Int. Cl.[2] C11D *1/83, 1/12, 3/065*

U.S. Cl. 252—532 **26 Claims**

1. A mechanically mixed, non-spray dried, powdered laundry detergent composition comprising:

(a) from about 4 to about 20 weight percent of the calcium salt of a non-soap, organic anionic surfactant;

(b) from about 4 to about 20 weight percent of an ethoxylated alcohol nonionic surfactant;

(c) from about 5 to about 70 weight percent of an alkali metal salt of a builder compound that precipitates hardness ions in water; and

(d) from 0 to about 40 weight percent of calcium carbonate as a crystallization seed; the percentages being based on the total weight of the composition.

4,162,995

METHOD AND COMPOSITION FOR RECLAIMING POLYURETHANE

Martin B. Sheratte, 6827 Nita Ave., Canoga Park, Calif. 91303

Filed Jul. 1, 1976, Ser. No. 701,672

Int. Cl.[2] C08J *11/00;* **C08G** *18/00*

U.S. Cl. 260—2.3 **41 Claims**

1. A process for decomposing polyurethane which comprises treating said polyurethane with ammonia in the absence of water, said ammonia selected from the group consisting of ammonia gas and anhydrous ammonia, completely liquefying said polyurethane, and recovering the reaction mixture.

4,162,996

FIBROUS MATERIALS USEFUL AS LEATHER SUBSTITUTES AND CONSISTING ESSENTIALLY OF LEATHER FIBERS, FIBRILS OR FIBRIDES OF SYNTHETIC POLYMERS AND CELLULOSE FIBERS

Paolo Parrini, Ferrara; Giuseppe Peroni, Gussago (Brescia); Guglielmo Corrieri, and Gian P. Righi, both of Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 25, 1977, Ser. No. 772,096

Claims priority, application Italy, Feb. 26, 1976, 20617 A/76

Int. Cl.[2] D21H *15/20;* **C08L** *89/00, 89/06, 7/02*

U.S. Cl. 260—4 R **5 Claims**

1. Fibrous material useful as a leather substitute and consisting essentially of:

(1) a fibers mixture made up of

30–60% by weight of leather fibers;

35–65% by weight of synthetic polymer fibrils, or fibrides having a surface area exceeding 1 m^2/g, the synthetic polymers being polymers of monomers selected from the group consisting of olefins, amides, styrene, acrylonitrile, acrylates, vinyl chloride and oxymethylene, and copolymers of said monomers;

5–15% by weight of cellulose fibers; and

(2) a polymeric organic binder for the fibrous material constituting said mixture, in an amount comprised between 3 and 50 parts by weight per 100 parts by weight of the fibers mixture.

4,162,997

HEAT-FUSIBLE PASTES FOR PRINTING INKS, ADHESIVES AND MOLDINGS

Robert M. Walsh, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 2, 1978, Ser. No. 882,847

Int. Cl.[2] C08L *91/00, 93/04*

U.S. Cl. 260—27 R **17 Claims**

1. A composition of matter in paste form comprising discrete solid particles of a glassy thermoplastic polymeric material, said polymeric material having been prepared from at least 51% of at least one monomer selected from the group consisting of acrylate-type monomers and monovinylidene aromatic monomers, said polymeric material having a glass transition temperature of at least about 50° C., and a particle diameter between about 0.05 micron and about 50 microns, said discrete solid particles of polymeric material being dispersed in a tackifying, cohesion-increasing material whose softening point is at or below room temperature, said polymeric material and said cohesion-increasing material being present in said composition

in a ratio of polymeric material to cohesion-increasing material of between about 1:6 to about 1:1.

4,162,998

PROCESS FOR PREPARATION OF ASPHALT-EPOXY RESIN COMPOSITION

Tadashi Doi, Osaka, and Harumi Takahashi, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,692
Claims priority, application Japan, Apr. 22, 1977, 52-47107
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28 R 14 Claims

1. A process for preparing an asphalt-epoxy resin composition which comprises: mixing heated asphalt at a temperature of from about 40° to about 250° C., with a mixture of (A) diepoxy compound and (B) an amine having only two amino hydrogen atoms in the molecule and having either an aliphatic hydrocarbon group having 8 to 22 carbon atoms or an alkylphenyl group in which the alkyl has 8 to 22 carbon atoms, said diepoxy compound (A) reacting with said amine (B) to form a thermoplastic linear epoxy resin uniformly distributed in said asphalt.

4,162,999

BLENDS CONTAINING ELASTOMERS

John Bohemen, Leatherhead, England, assignor to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 873,550, Jan. 30, 1978, abandoned. This application Feb. 6, 1978, Ser. No. 875,435
Int. Cl.[2] C08L *91/00;* C08F *14/02;* C08C *19/20*
U.S. Cl. 260—28.5 B 14 Claims

1. A composition which comprises a blend of a chlorine-containing synthetic elastomer and a hardened extract having a saturated hydrocarbon content of not more than 10% w/w and obtained by blowing a gas containing free oxygen into a petroleum extract at elevated temperatures, the petroleum extract having been obtained by the solvent extraction of a product of petroleum refining which is a distillate petroleum fraction or a deasphalted petroleum residue or a blend of this deasphalted residue and distillate, which product boils above 350° C. at atmospheric pressure and which contains a major proportion of aromatic hydrocarbons, characterized in that the composition contains about at least 0.03% by weight, based on the total composition, of an aliphatic amine containing 8 to 24 carbon atoms in the molecule.

4,163,000

FOUNDRY MOLD COMPOSITION AND PROCESS FOR PRODUCING FOUNDRY MOLD

Jiro Kashima, and Synji Sato, both of Urawa, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1977, Ser. No. 856,805
Claims priority, application Japan, Dec. 3, 1976, 51-145809; Apr. 6, 1977, 52-39752; Apr. 6, 1977, 52-39753; Jul. 22, 1977, 52-88490
Int. Cl.[2] C08L *25/04;* B28B *7/34*
U.S. Cl. 260—29.6 S 11 Claims

1. A foundry mold composition which comprises a foundry mold sand, a binder in an amount of at least 1 part by weight per 100 parts by weight of the sand and sufficient to bind the sand and less than 1 part by weight of clay per 100 parts by weight of the sand, said binder consisting essentially of an aqueous solution of a water-soluble copolymer of a maleic acid-type monomer selected from the group consisting of maleic acid, maleic anhydride and maleic acid esters and a styrene comonomer and water glass and having a weight ratio of copolymer solids to water glass solids of 1:0.5 to 10.

10. A process for producing a foundry mold, which comprises mixing 100 parts by weight of a foundry mold sand containing less than 1 part by weight of clay with from about 2 to about 10 parts by weight of a binder consisting essentially of water glass and an aqueous solution of a water-soluble copolymer of a maleic acid type monomer selected from the group consisting of maleic acid, maleic anhydride and maleic acid esters and a styrene comonomer and having a viscosity of about 500 to about 10,000 centipoises, forming the mixture into a mold, and contacting the mold with carbon dioxide gas.

4,163,001

WATER BASE FLEXOGRAPHIC DYE INK

Constantine G. Carumpalos, and Harry E. Pansing, both of Cincinnati, Ohio, assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 365,337, May 30, 1973, abandoned. This application Sep. 25, 1978, Ser. No. 945,220
Int. Cl.[2] C09D *11/10*
U.S. Cl. 260—29.6 MN 9 Claims

1. A water-based chlorine-bleachable dye ink concentrate comprising 1–10 parts by weight of an alkali-stable basic dye containing at least one amino group laked by reaction with 5–20 parts by weight of a laking resin selected from the group consisting essentially of acidic phenolic resins, acidic acrylic resins and mixtures thereof, in a liquid medium consisting essentially of 30–55 parts by weight of butyl Carbitol ®, 20–35 parts by weight of water, 0.25–5 parts by weight of dissolved sodium benzoate, 1–3 parts by weight of a nonionic surfactant, 0.05–0.2 part by weight of a defoamer, 5–10 parts by weight of a dissolved acrylic acid binder resin, and 1–5 parts by weight of aminoalcohol.

4,163,002

FILLER-FORTIFIED POLYALKYLENETEREPHTHALATE MOLDING COMPOSITIONS

Werner Pohl, Troisdorf-Spich; Ernst Schainberg, Troisdorf; Werner Schmidt, St. Augustin, and Günter Tappe, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 808,413
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627869
Int. Cl.[2] C08J *3/20;* C08K *7/14;* C08L *67/02*
U.S. Cl. 260—40 R 19 Claims

1. A process for preparing a filler-fortified polyalkyleneterephthalate molding composition which comprises mixing a filler with a precondensate having a viscosity number of from 40 to 160 cm^3/g of poly-(1,4-butylene)-terephthalate and/or poly-(1,3-propylene)-terephthalate, forming the resultant mixture into a shape and thereafter polymerizing the precondensate by solid-phase condensation under solid-phase condensation conditions.

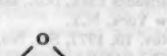
4,163,003

UNSATURATED EPOXIDES AS COUPLING AGENTS FOR CARBON FIBERS AND UNSATURATED MATRIX RESINS

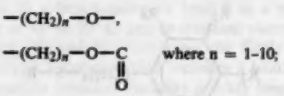
James T. Paul, Jr., and Winfred E. Weldy, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed May 23, 1975, Ser. No. 580,501
Int. Cl.[2] C08K *7/02, 9/04*
U.S. Cl. 260—40 R 37 Claims

1. A composite structure which is a cured admixture comprising (a) carbon fibers, (b) an unsaturated matrix resin and (c) an unsaturated epoxide bifunctional coupling agent having the general structural formula:



wherein X is a radical selected from the group consisting of



and divalent alkyl, aryl, aralkyl and alkaryl radicals containing up to 20 carbon atoms, and R is an unsaturated radical selected from the group consisting of

(a) ethylenically unsaturated C_1–C_4 aliphatic radicals,

(b) an aryl radical containing an ethylenically unsaturated C_1–C_4 aliphatic substituent

(c) the alpha - terpinyl radical,

(d) the gamma - terpinyl radical and

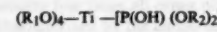
(e) the abietyl radical.

4,163,004
DENTAL FILLING MATERIALS

Wallace A. Erickson, Chicago, and Byoung I. Suh, Glen Ellyn, both of Ill., assignors to Wallace A. Erickson & Company, Chicago, Ill.

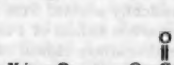
Filed Jun. 17, 1977, Ser. No. 807,555
Int. Cl.² C08K *9/04*
U.S. Cl. 260—42.14 **7 Claims**

1. A process for treating a finely divided inorganic filler for improving its bonding properties to an active polyfunctional polymerizable monomer having at least two acrylic end groups, which method comprises treating said finely divided inorganic filler with a solution of a tetra (alkenyloxy) titanium di (di-alkyl) phosphite having the formula

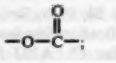


wherein R_1 is an organic radical having the formula —A—(XB)n
in which

A is a straight of branched chain, divalent or trivalent, hydrocarbon radical having 3 to 8 carbon atoms;



B is a straight or branched chain hyrocarbon radical having at least one terminal double bond and 3 to 8 carbon atoms when X is —O—, or 2 to 7 carbon atoms when X is



n is 1 or 2; and

R_2 is a straight or branched chain alkyl group having 6 to 16 carbon atoms;

removing excess solution; and

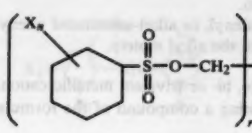
heating said filler at a temperature of about 110°–130° C. for a period sufficient to improve the shelf life of a mixture of said monomer, said filler, and a free radical generating catalyst suitable for polymerizing said monomer.

4,163,005
HALOBENZENE SULFONATE FLAME RETARDANTS

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 11, 1977, Ser. No. 823,773
Int. Cl.² C07C *143/68*; C08K *5/42*
U.S. Cl. 260—45.7 S **13 Claims**

1. A halobenzene sulfonate of the formula



wherein X and X′ are independently selected halogen, n is an integer of from 1 to 5, and r is an integer of from 1 to 4.

7. A flame retardant plastic polymer composition comprising a polymer and a flame retarding amount of a sulfonate compound of claim 1.

4,163,006
COMPOSITIONS STABILIZED WITH POLYALKYLTHIOBENZENES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 9, 1977, Ser. No. 795,269
Int. Cl.² C08K *5/37*; C10M *1/38, 1/42*
U.S. Cl. 260—45.8 NT **10 Claims**

1. A method of stabilizing organic material subject to oxidative deterioration by incorporating therein 0.01 to 5% of a stabilizer having the formula

wherein

R is an alkyl group of 1 to 24 carbon atoms, a cycloalkyl group of 4 to 7 carbon atoms or an alkylcycloalkyl group of 7 to 30 carbon atoms,

R′ is an alkyl group of 1 to 18 carbon atoms,

n is an integer from 2 to 6

x is an integer from 0 to 4 provided that n + x is not greater than 6.

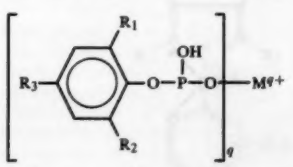
2. A method of claim 1 wherein said organic material is selected from an olefinic polymer, chlorinated polyolefin, a diene rubber and lubricating oil.

4,163,007
NEW STABILIZERS

Hanns Lind, Fullinsdorf, and Paul Moser, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,526
Claims priority, application Switzerland, Jul. 30, 1976, 9764/76
Int. Cl.² C08K *5/52*; C07F *7/22, 9/02*
U.S. Cl. 260—45.75 R **7 Claims**

1. A compound of the general formula I

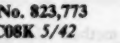


(I)

wherein

R_1 and R_2 independently of one another are C_1–C_8-alkyl, C_5–C_8-cycloalkyl or C_7 -C_9-aralkyl,

R_3 is a group of the formula II



(II)

wherein n is 0 to 6,

R_4 is C_1–C_{24}-alkyl, phenyl, or alkyl-substituted phenyl having 1–12 C atoms in the alkyl moiety,

q is 1, 2 or 3,

M^{q+} is H^+ or a mono-, bi- or trivalent metallic cation.

5. A polymer containing a compound of the formula I according to claim 1.

4,163,008

DUAL PURPOSE STABILIZER COMPOUNDS AND POLYMER COMPOSITIONS CONTAINING SAME

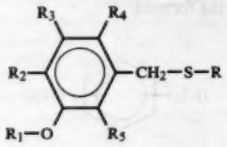
Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 31, 1978, Ser. No. 892,005

Int. Cl.[2] C08K *5/36;* **C07C** *153/07*

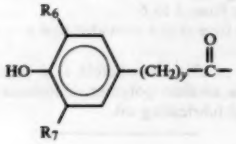
U.S. Cl. 260—45.85 B **6 Claims**

1. Compounds of the formula



wherein

R and R1 are the same and are selected from among the following



with

R_6 and R_7 being an aliphatic hydrocarbon radical of 3 to 10 carbon atoms; and y being 0–5;

R_2 is a tertiary aliphatic hydrocarbon radical having from 4 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 4 to 10 carbon atoms, where the carbon atom of attachment to the aromatic ring is fully substituted;

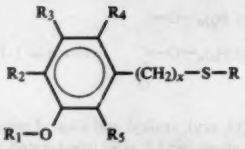
R_3 is hydrogen, halogen, an aliphatic hydrocarbon radical having from 1 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 3 to 10 carbon atoms; and

R_4 and R_5 is

where

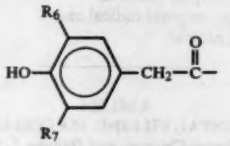
A and A′ are independently selected from among hydrogen, an aliphatic hydrocarbon radical of 1 to 10 carbon atoms or an alicyclic hydrocarbon radical of 3 to 10 carbon atoms.

3. A composition comprising a polymer which is sensitive to oxidative degradation and an antioxidant effective amount of at least one compound of the formula



wherein

R and R_1 are the same and are selected from among the following



with

R_6 and R_7 being an aliphatic hydrocarbon radical of 3 to 10 carbon atoms; and y being 0–5;

R_2 is a tertiary aliphatic hydrocarbon radical having from 4 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 4 to 10 carbon atoms, where the carbon atom of attachment to the aromatic ring is fully substituted;

R_3 is hydrogen, halogen, an aliphatic hydrocarbon radical having from 1 to 10 carbon atoms or an alicyclic hydrocarbon radical having from 3 to 10 carbon atoms; and

R_4 and R_5 is

where

A and A′ are independently selected from among hydrogen, an aliphatic hydrocarbon radical of 1 to 10 carbon atoms or an alicyclic hydrocarbon radical of 3 to 10 carbon atoms.

4,163,009

METHOD OF SEPARATING ANIMAL RAW MATERIAL

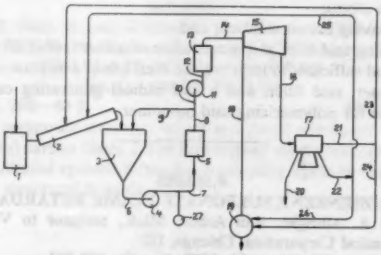
Poul Filstrup, Virum, Denmark, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jan. 24, 1978, Ser. No. 871,828

Claims priority, application Sweden, Jan. 27, 1977, 7700842 3

Int. Cl.[2] A23J *1/02*

U.S. Cl. 260—112 R **3 Claims**



1. A method of separating animal raw material, such as slaughter-hour offal, into one fat fraction and at least one protein fraction, which comprises the steps of finely dividing

the raw material, subjecting the finely divided raw material continuously to a first heating to heat it to a relatively low temperature of 45° to 70° C. and at constant viscosity, said first heating being effected by circulating the finely divided raw material through a circuit which includes a heating zone, and means to maintain constant viscosity quickly heating a flow of warm material from said first heating to a higher temperature of 85° to 100° C., immediately separating said quickly heated flow by centrifugal separation to provide said fat fraction and said protein fraction, and adding water to the material subjected to said first heating.

4,163,010

ISOLATION OF PROTEINACEOUS MATERIALS

John T. Garbutt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Apr. 27, 1978, Ser. No. 900,499

Int. Cl.² A23J *1/16*

U.S. Cl. 260—112 R **6 Claims**

1. A process which comprises subjecting corn steep liquor to ultrafiltration to obtain a retentate containing protein, treating the retentate with an alkaline precipitating agent to precipitate non-proteinaceous material in said retentate, and separating the precipitate from said protein-containing retentate.

4,163,011

PEPTIDE COMPOUNDS AND COMPOSITIONS

Richard J. Orts, Rte. 3, Box 251C, Stillwater, Okla. 74074

Filed Aug. 28, 1978, Ser. No. 937,300

Int. Cl.² C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 R **2 Claims**

1. A bovine pineal antigonadotrophic tripeptide, being substantially free from all other pineal-derived substances, which is characterized by the amino acid sequence: Threonine-serine-lysine.

4,163,012

PROCESS FOR THE PREPARATION OF CONCENTRATED DYESTUFF SOLUTIONS

Erich Kramer; Horst Nickel, both of Leverkusen, and Fritz Puchner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1975, Ser. No. 626,477

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1974, 2451257

Int. Cl.² C09B *35/16, 41/00*

U.S. Cl. 260—182 **2 Claims**

1. In a process for the preparation of concentrated aqueous or aqueous-organic solutions of low electrolyte content of azo or disazo dyestuffs containing sulfonic acid groups obtained by diazotization with sodium nitrite in the presence of sulfuric acid and by coupling, the improvement which consists essentially of performing the alkaline coupling reaction in the presence of calcium hydroxide whereby calcium sulfate is simultaneously precipitated and separated from the reaction medium and a concentrated solution of the resulting dyestuff is recovered.

4,163,013

DIPHENYLAMINE-AZO-HYDROCARBYLSULFONYL-PHENYL DYESTUFFS

Herbert Hugl; Karl H. Schündehütte, both of Leverkusen; Kersten Trautner, Cologne, and Gerhard Wolfrum, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

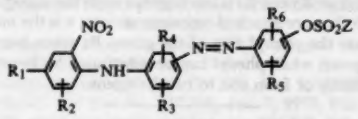
Filed Jul. 6, 1977, Ser. No. 813,315

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630990

Int. Cl.² C09B *43/18*

U.S. Cl. 260—206 **7 Claims**

1. Azo dyestuffs according to the formula



wherein

R_1 represents H, NO_2, CN, CF_3, halogen, C_1–C_4-alkyl, SO_2X_1, SO_2OX_1, $CONX_2X_3$, SCN, OX_1, SX_1 or NX_2X_3,

R_2 represents H, NO_2, halogen, C_1–C_4-alkyl, OX_1 or phenyl,

R_3 and R_4 independently of one another represent H, halogen, C_1–C_4-alkyl, SO_2X_1, SO_2OX_1, COX_1, $CONX_2X_3$, NX_2X_3, OH, OX_1 or phenyl,

R_5 represents H, halogen, C_1–C_4-alkyl, OX_1 or phenyl,

R_6 represents H or C_1–C_4-alkyl,

X_1 denotes C_1–C_4-alkyl, phenyl, benzyl or phenethyl, X_2 and X_3 independently of one another denote H, C_1–C_4-alkyl, C_5–C_7-cycloalkyl, phenyl, benzyl, phenethyl or the radical of a heterocyclic structure or, conjointly with the N atom, denote a 5-membered to 7-membered saturated heterocyclic structure,

Z represents C_1–C_4-alkyl, benzyl, phenethyl, C_5–C_7-cycloalkyl or phenyl, and the above-mentioned alkyl, benzyl, phenethyl, cycloalkyl and phenyl radicals as well as the heterocyclic radicals can contain further non-ionic substituents.

4,163,014

3,4,5,6-TETRAHYDROPYROMELLITDIIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 802,168, May 31, 1977, Pat. No. 4,125,536, which is a division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Aug. 21, 1978, Ser. No. 935,195

Int. Cl.² C07D *487/04*

U.S. Cl. 260—326 C **3 Claims**

1. N,N′-diphenyl-3,4,5,6-tetrahydropyromellitdiimide.
2. N,N′-dialkyl-3,4,5,6-tetrahydropyromellitdiimides.

4,163,015

1-(ARYLAMINO)PYRROLES

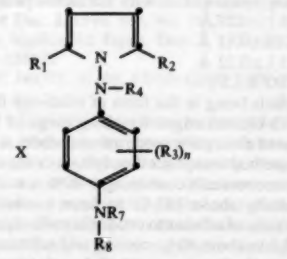
Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 730,162, Oct. 7, 1976, Pat. No. 4,138,405, which is a division of Ser. No. 585,448, Jun. 9, 1975, Pat. No. 4,051,147, which is a continuation-in-part of Ser. No. 372,324, Jun. 21, 1973, abandoned. This application May 22, 1978, Ser. No. 908,468

Int. Cl.² C07D *403/12, 207/50*

U.S. Cl. 260—326.25 **2 Claims**

1. A compound having the formula:



where R_1 and R_2 are each hydrogen or each lower-alkyl; R_3 is hydrogen; R_4 is lower-alkanoyl or benzoyl; X represents two

hydrogen atoms; R_7 is hydrogen; R_8 is lower-alkyl, phenyl or 1-pyrrolyl, or R_7 and R_8 taken together with the nitrogen atom to which they are attached represent nitroso; n is the integer 1, and where the phenyl ring of the group R_4 when benzoyl or the R_8 group when phenyl can be substituted by lower-alkyl, lower-alkoxy or from one to two halogens.

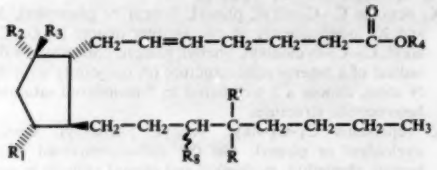
4,163,016

16-SUBSTITUTED PROSTAGLANDINS

George W. Holland, and Perry Rosen, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 5, 1977, Ser. No. 813,068
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—345.8 P **13 Claims**

1. A compound of the formula:



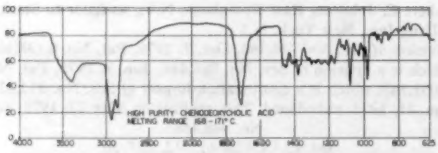
wherein R_4 is hydrogen or lower alkyl; R_2 is hydroxy; R_3 is hydrogen or taken together with R_2 forms oxo; R_1 is lower alkyl; R′ is fluoro or trifluoromethyl; R is hydrogen, fluoro or lower alkyl; R_8 is hydroxy, benzoyloxy, lower alkanoyloxy, benzyloxy, benzhydryloxy, trimethylsilyloxy; or tetrahydropyranyloxy or their optical antipodes or racemates thereof.

4,163,017

HIGH PURITY CHENODEOXYCHOLIC ACID AND METHOD FOR OBTAINING SAME

Siegfried Maeke, Kirchdorf, and Paul Rambacher, Rosenheim-Mitterfeld, both of Fed. Rep. of Germany, assignors to Diamalt Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,080
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613346
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.1 **5 Claims**



1. The method for producing chenodeoxycholic acid suitable for human therapeutic use, characterized by a monoclinic crystallographic system with the lattice parameters

$a = 19.1 \pm 0.29$ Å
$b = 8.21 \pm 0.12$ Å
$c = 15.1 \pm 0.22$ Å
$\beta = 100° \pm 1.5°$;

the crystals being in the form of relatively flat prisms or needles with blunted edges; a melting range of 168°–171° C.; and an infrared absorption spectrum essentially as shown in FIG. 1, which method comprises dissolving a crude chenodeoxycholic acid in acetronitrile containing 0–10% water at a temperature substantially above 18° C. to form a solution in which the weight ratio of solvent to crude chenodeoxycholic acid is from about 8:1 to about 40:1; cooling said solution to at least 18° C. but above the freezing point of the solution and thereby causing the pure chenodeoxycholic acid to precipitate in crystalline form; and recovering the crystalline product.

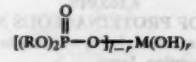
4,163,018

PROCESS FOR PREPARING METAL SALTS OF ALKYL PHOSPHATES

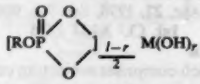
Fusao Tada, Toyonaka; Jajimu Shimizu, Nara; Tsutomu Asaoka, Kishiwada, and Fuminori Matsumoto, Sakai, all of Japan, assignors to Sakai Chemical Industry Company, Ltd., Japan

Filed Dec. 13, 1977, Ser. No. 860,408
Claims priority, application Japan, Dec. 18, 1976, 51-153175
Int. Cl.[2] C07F *3/06*
U.S. Cl. 260—429.9 **4 Claims**

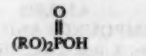
1. A process for preparing metal salts of an alkyl phosphate corresponding to either one of the formulae:



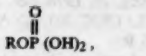
and



having a high apparent specific volume which comprises reacting an alkyl phosphate corresponding to either one of the formulae:



and



in the form of its alkali metal salt, with a metal salt of the formula: M_nX_m in an aqueous medium at a temperature of from about 50° to 80° C., and recovering the reaction product from the reaction mixture, followed by filtration, water washing, drying and pulverizing, the operations on the recovery and thereafter being carried out at a temperature of not higher than 80° C.; in the above formulae R being an alkyl group of not less than 12 carbon atoms, M being an alkaline earth metal, aluminum or zinc, X being halogen, sulfate or nitrate, l being an integer corresponding to the atomic valency of M, r being the integer 0, 1 or 2, m being the integer 1, 2 or 3 and n being the integer 1 or 2.

4,163,019

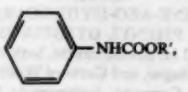
PRODUCTION OF 4,4′-ALKYLIDENE DIPHENYL DIISOCYANATE

Frank D. Mango, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

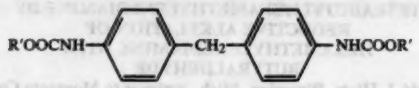
Filed Jul. 10, 1978, Ser. No. 922,903
Int. Cl.[2] C07C *118/00, 119/048, 125/06*
U.S. Cl. 260—453 P **10 Claims**

2. Process for the selective production of 4,4′-methylene diphenyl diisocyanate, consisting essentially of the steps of

(1) condensing formaldehyde with a compound

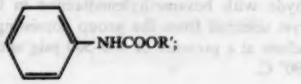


wherein R′ is the residue of an alcohol which is capable of reacting with phenyl isocyanate to produce the corresponding carbamate and which does not contain any reactive groups that interfere with the reactions, of steps (1) and (2), under mild condensation reaction conditions in a polar solvent, to yield the dicarbamate of formula



and water;

(2) reacting said dicarbamate with phenyl isocyanate in the presence of a catalytic amount of an effective exchange reaction catalyst under mild reaction conditions to yield 4,4'-methylene diphenyl diisocyanate and



and

(3) continuously removing and recovering said diisocyanate from the exchange reaction mixture.

4,163,020

2-TRICHLOROMETHYL-4-NITROBENZENESULFENIC ACID DERIVATIVES

Helmut Hagen, Frankenthal; Wolfgang Reuther, Ziegelhausen; Ernst-Heinrich Pommer, Limburgerhof, and Helmut Fleig, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

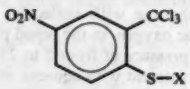
Filed Apr. 24, 1978, Ser. No. 899,523

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721917

Int. Cl.[2] C07C *161/02, 145/00*

U.S. Cl. 260—454 **3 Claims**

1. A 2-trichloromethyl-4-nitrobenzenesulfenic acid derivative of the formula



where X is —Cl or —CN.

4,163,021

SYNTHESIS OF 2,6,10-TRIMETHYL-UNDECAN-1-OL

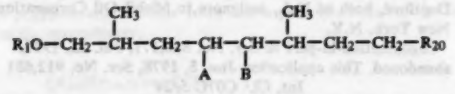
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 796,929, May 16, 1977, Pat. No. 4,107,183, which is a division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 12, 1978, Ser. No. 905,324

Int. Cl.[2] C07C *143/68*

U.S. Cl. 260—456 P **2 Claims**

1. A compound of the formula:



wherein A and B are individually hydrogen or taken together form a carbon to carbon bond; R_{20} is MgX or —OR_6; X is halogen; R_6 is p-toluenesulfonyl, naphthylsulfonyl or lower alkylsulfonyl; R_1 is benzyl, benzhydryl, trityl, methoxymethyl, trimethylsilyl, tetrahydropyranyl or t-butyl, with the proviso that when R_1 is benzyl, benzhydrydyl or trityl, A and B form a carbon to carbon bond.

4,163,022

CARBAMYLGUANIDINE ANTIMICROBIAL COMPOUNDS

Julius Diamond, Mountain Lakes, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 757,577, Jan. 7, 1977, Pat. No. 4,115,447, and Ser. No. 757,600, Jan. 7, 1977, Pat. No. 4,115,448, which is a division of Ser. No. 546,549, Feb. 3, 1975, Pat. No. 4,002,962. This application Aug. 7, 1978, Ser. No. 931,511

Int. Cl.[2] C07C *127/15;* A61K *31/17*

U.S. Cl. 260—553 R **7 Claims**

1. A compound having the formula Z-B-Y-B'-Z wherein Y is a bivalent organic radical selected from the group consisting of C_2–C_{12} alkylene, C_5–C_{12} cycloalkylene, C_5–C_{12} cycloalkylenebis(loweralkyl), C_6–C_{12} arylene and loweralkylarylene, C_7–C_{12} arylenelowerallkyl, and C_8–C_{12} arylenebis(loweralkyl); B is a substituted guanidino group selected from the group consisting of carbamylguanidino and thiocarbamylguanidino; B' is B or biguanidino, provided that B' is biguanidino only when B is carbamylguanidino bonded to Y through the guanidino portion of the group; and Z is selected from the group consisting of C_4–C_{12} dialkylaminoalkyl; C_1–C_{10} alkoxy C_{10}–C_2 alkyl having a total carbon content of C_3–C_{14}; C_1–C_{10} alkylthio C_{10}–C_2 alkyl having a total carbon content of C_3–C_{14}; phenoxy C_2–C_6 alkyl; phenylthio C_2–C_6 alkyl; C_7–C_{14} arylcycloalkyl; and C_6–C_{14} aryl and aralkyl substituted with one or more radicals selected from the group consisting of phenoxy, nitro, cyano, C_2–C_6 acyl, benzoyl, alkoxycarbonyl, diloweralkylamino, with the proviso that when Y is C_2–C_{12} alkylene, and B and B' are carbamylguanidino then Z is additionally selected from the group consisting of C_7–C_{14} aralkyl and aralkyl substituted with one or more radicals selected from the group consisting of loweralkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, loweralkylthio, halo, loweralkylsulfonyl, fluorosulfonyl and alkylsulfinyl; and C_6–C_{14} aryl substituted with one or more radicals selected from the group consisting of fluorosulfonyl and alkylsulfinyl; and with the further proviso that when B is thiocarbamylguanidino; or B' is thiocarbamylguanidino or biguanidino, then Z is additionally selected from the group consisting of C_1–C_{12} alkyl; C_3–C_{12} alkenyl; C_3–C_{12} alkynyl; C_3–C_{12} cycloalkyl, C_4–C_{12} cycloalkylalkyl; C_6–C_{14} aryl; C_7–C_{14} aralkyl; and C_6–C_{14} aryl and aralkyl substituted with one or more radicals selected from the group consisting of loweralkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, loweralkylthio, halo, and loweralkylsulfonyl, and pharmacologically acceptable addition salts of these compounds with acids represented by nHA wherein n=½, ⅓, ⅔, 1, and 2 HA is an inorganic or organic acid.

4,163,023

TREATMENT OF PHOTOGRAPHIC PROCESSING SOLUTIONS

Akira Endo, and Tohru Kitahara, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1976, Ser. No. 746,753

Claims priority, application Japan, Dec. 2, 1975, 50-143537; Oct. 19, 1976, 51-125838

Int. Cl.[2] C07C *143/75, 91/06, 87/58;* G03C *5/30, 7/30*

U.S. Cl. 260—556 A **9 Claims**

1. A process of selectively separating a p-phenylene diamine derivative from a photographic processing solution which comprises bringing the photographic processing composition into contact with a porous copolymer of a monoester of a monohydric alcohol or polyhydric alcohol and methacrylic acid and a polyester of a polyhydric alcohol and methacrylic acid, said copolymer being a porous copolymer having a pore volume of about 0.2 to about 1.5 ml/g, a specific area of about 100 to about 700 m^2/g and a pore diameter of 30 to about 2,000 A.

4,163,024

PROCESS FOR CONTROLLING THE CATALYTIC CO-OLIGOMERIZATION OF 1,3-DIENES WITH SCHIFF'S BASES

Paul Heimbach; Achim Roloff, and Erich F. Nabbefeld-Arnold, all of Mülheim, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH., Mülheim, Fed. Rep. of Germany

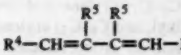
Filed Aug. 1, 1977, Ser. No. 820,962

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638430

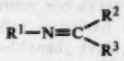
Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 R 4 Claims

1. A process which comprises condensing a 1,3-diene of the formula



wherein R^4 and R^5, independently of one another, represent hydrogen or an alkyl group having 1 to 4 carbon atoms with a Schiff base of the formula



wherein each of R^1, R^2 and R^3 represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 7 ring members, aralkyl in which the aryl portion is carbocyclic and has up to 10 ring members and the alkyl portion has up to 7 carbon atoms; or dimethylamino or dimethylamino substituted by alkyl ethers having up to 12 carbon atoms, alkyl esters having up to 12 carbon atoms or C=N double bonds, in the presence of a nickel (O)—containing catalyst, and optionally in the presence of a conventional electron donor and a conventional weakly H-acid compound, said weakly H-acid compound being a primary or secondary amine, a cycloalkyl amine having 4 to 8 ring members, a carbocyclic arylamine having up to 10 ring members, a mono- or di-aza-cyclic carbocyclic amine having 5 to 7 ring members, and unsaturated carbocyclic cycloalphatic amine having up to 3 double bonds and optionally N-alkylated wherein the N-alkyl portion has up to 7 carbon atoms, an alkyl- or aryl-phosphor hydrogen compound, an alcohol, an organic acid or water, with a molar ratio of Ni: weakly H-acid compound of from 1:0 to 1:10.

4,163,025

PROCESS FOR THE PRODUCTION OF BENZYLAMINE AND DIBENZYLAMINE

Richard A. Plunkett, Elkhart; Jerry L. Neff, Nappanee, and Timothy A. Bemish, Bremen, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 16, 1975, Ser. No. 541,494

Int. Cl.[2] C07C *85/12*

U.S. Cl. 260—570.9 7 Claims

1. A process for preparing benzylamine, which comprises passing undiluted benzonitrile and hydrogen countercurrently through a catalyst bed, wherein the catalyst is selected from the class consisting of Raney nickel, zirconium promoted reduced nickel and platinum, under suitable conditions of temperature and pressure to thereby hydrogenate the benzonitrile and produce the desired reaction product, wherein the pressure is greater than about 115 p.s.i.a. and the ratio of hydrogen flow to benzonitrile flow based upon the relative volumes passed per unit of time in countercurrent fashion is less than about 600.

4,163,026

PRODUCTION OF TETRABUTYLHEXAMETHYLENEDIAMINE BY REDUCTIVE ALKYLATION OF HEXAMETHYLENEDIAMINE WITH BUTYRALDEHYDE

Harold J. Hintz, Riverview, Mich., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,301

Int. Cl.[2] C07C *85/08*

U.S. Cl. 260—583 P 7 Claims

1. A process for the production of tetrabutylhexamethylenediamine from butyraldehyde and hexamethylendiamine comprising continuously reacting controlled amounts of butyraldehyde with hexamethylenediamine in the presence of a catalyst selected from the group consisting of platinum and palladium at a pressure of 300–500 psig and a temperature of 70°–90° C.

4,163,027

WORKING-UP OF REACTION MIXTURES CONTAINING CYCLOHEXANOL AND CYCLOHEXANONE

Peter Magnussen, Bad Duerkheim; Guenter Herrmann, Neustadt, and Elmar Frommer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,985

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650892; Oct. 8, 1977, 2745448

Int. Cl.[2] C07C *27/12, 27/26, 29/24, 45/24*

U.S. Cl. 260—586 P 9 Claims

1. In a process for working up reaction mixtures containing cyclohexanol and cyclohexanone, which have been obtained by oxidizing cyclohexane with molecular oxygen or gases containing molecular oxygen, in the liquid phase, at from 130° to 200° C. under a pressure of from 5 to 25 bars, working-up being effected by treatment with aqueous solution of an alkali metal hydroxide and/or alkali metal carbonate in two stages, the fresh aqueous alkali metal hydroxide and/or alkali metal carbonate solution being fed to the second stage and the separated-off spent alkali being brought into contact with fresh reaction mixture in the first stage, the improvement of carrying out the treatment in the first stage in the presence of inert gases and separating off the inert gases before the second stage.

4,163,028

XYLENE ISOMERIZATION

Samuel A. Tabak, Wenonah, and Roger A. Morrison, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

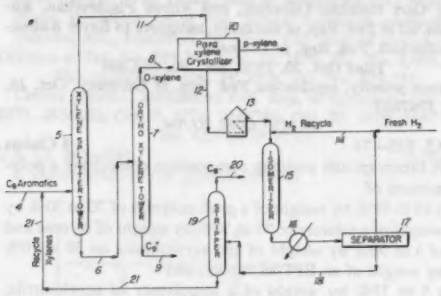
Continuation-in-part of Ser. No. 818,171, Jul. 22, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,681

Int. Cl.[2] C07C *5/24*

U.S. Cl. 585—481 13 Claims

1. In a process for isomerizing the xylene content of a charge mixture of eight carbon atom aromatic hydrocarbon compounds which mixture contains xylene and ethyl benzene by contact at conversion conditions with a catalyst comprising a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, the improvement resulting in con-

version of ethyl benzene to benzene which comprises using as said catalyst a zeolite having a silica/alumina ratio of at least



500 maintaining a conversion temperature of about 800° F. to about 1000° F.

4,163,029

HIGH SOLIDS COATING COMPOSITIONS

Oliver W. Smith, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 690,185, May 26, 1976, Pat. No. 4,101,603. This application Apr. 20, 1978, Ser. No. 898,104

Int. Cl.[2] C08L *67/04*; C08G *63/76*; C08L *61/32*

U.S. Cl. 525—449 **17 Claims**

1. A high solids composition comprising from (I) 20 to 80 weight percent of polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40 to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone-epoxide adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.2 to 1 mole of an organic diepoxide per mole of polycaprolactone intially charged and (iii) from 0.1 to 0.5 carboxylic anhydride equivalent per each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid.

4,163,030

NOVEL POLYETHERAMIDE-IMIDE PHENOLIC RESIN BLENDS

Eugene G. Banucci, Scotia, and Edith M. Boldebuck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 628,330, Nov. 3, 1975. This application Jul. 3, 1978, Ser. No. 921,366

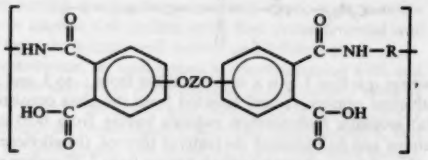
Int. Cl.[2] C08L *63/00, 71/00, 77/00, 79/00*

U.S. Cl. 525—429 **20 Claims**

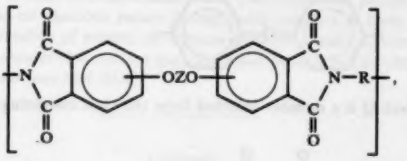
1. A polyetheramide-imide phenolic resin blend comprising a polyetheramide-imide resin and a phenolic resin of the formula, respectively,

$$([A]_m[B]_{1-m})_a \text{ and } ([C])_b$$

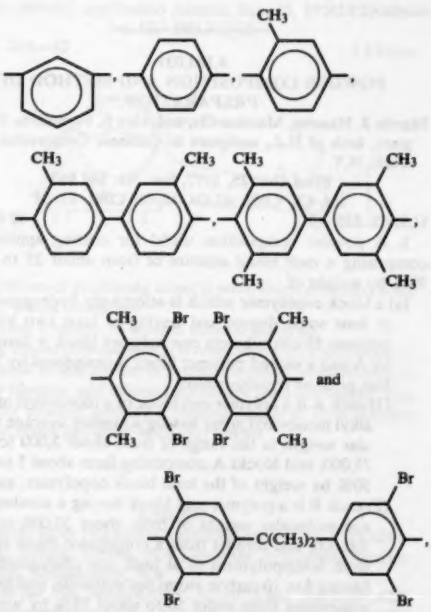
wherein A represents a polyamide unit and B represents a polyimide unit of a polyetheramide-imide resin, m represents a mole fraction number greater than or equal to zero, C represents a phenolic resin, a represents a resin blend proportion number greater than zero and less than 1, the sum of a plus b equals 1.0, further wherein said polyamide unit is of the formula:



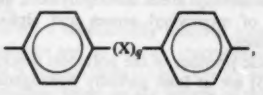
and said polyimide unit is of the formula:



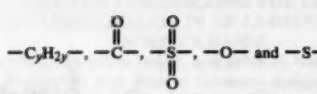
wherein the O—Z—O units of said polyamide or said polyimide units are in the 3 or 3' or 4 or 4' positions and Z is a member of the class consisting of (1)



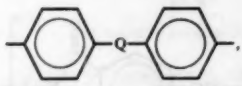
and (2) divalent organic radicals of the general formula



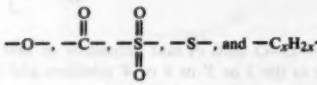
where X is a member selected from the class consisting of divalent radicals of the formulas



where q is 0 or 1, y is a whole number from 1, to 5, and R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6-20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2-20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of



and x is a whole number from 1 to 5 inclusive and further wherein said phenolic resin has an average molecular weight in excess of 125.

4,163,031

POWDER COMPOSITION AND METHOD OF PREPARATION

Martin J. Hannon, Martinsville, and Alex S. Forschirm, Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,963

Int. Cl.[2] C08L *43/04, 53/00;* C09L *83/04*

U.S. Cl. 525—5 **40 Claims**

1. A powder composition useful for coating applications comprising a melt blend mixture of from about 25 to about 90% by weight of

(a) a block copolymer which is selectively hydrogenated to at least some degree and having at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(1) each A is a polymer end block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said blocks A comprising from about 5 to about 50% by weight of the total block copolymer, and

(2) each B is a polymer mid block having a number average molecular weight of from about 30,000 to about 300,000, and formed from a conjugated diene selected from homopolymers of at least one conjugated diene having 4 to 10 carbon atoms per molecule, said blocks B comprising from about 50 to about 95% by weight of the total block copolymer, and

(b) from about 10 to about 75% by weight of at least one melt flow modifier selected from the group consisting of

(1) monovinyl arene hompolymers,

(2) alpha alkyl monovinyl arene homopolymers, and

(3) copolymers of monovinyl arenes and alpha alkyl monovinyl arenes,

wherein the aromatic portions of the polymers described in (b)(1), (2) and (3) are at least partially hydrogenated to remove the aromatic character thereof,

wherein said powder composition possesses good melt flow characteristics under zero shear conditions.

4,163,032

THERMOPLASTIC MOLDING COMPOSITIONS

Lothar Liebig; Frank Wingler; Karl-Heinz Ott, all of Leverkusen; Gert Humme, Odenthal, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,000

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747823

Int. Cl.[2] C08L *51/04*

U.S. Cl. 525—74 **4 Claims**

1. A thermoplastic molding composition comprising a polymer mixture of

(A) 25 to 95% by weight of a graft polymer of 70 to 30% by weight of a mixture of 95 to 50% by weight of styrene and of 5 to 50% by weight of and acrylonitrile on 30 to 70% by weight of an EPDM-rubber, and

(B) 5 to 75% by weight of a terpolymer of acrylonitrile, maleic acid anhydride and styrene,

the terpolymer containing

10 to 30 parts by weight of acrylonitrile,

7.5 to 15 parts by weight of maleic acid anhydride, and

82.5 to 55 parts by weight of styrene in copolymerised form.

4,163,033

METHOD OF POLYMERIZING VINYL HALIDE WITH OLEFIN POLYMERS AND COPOLYMERS AND COMPOSITIONS THEREOF

Akio Takahashi, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 674,202, Apr. 5, 1976, which is a continuation-in-part of Ser. No. 427,895, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 251,099, May 8, 1972, abandoned. This application Nov. 30, 1976, Ser. No. 746,046

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] C08F *255/2, 255/4, 255/6, 255/10*

U.S. Cl. 525—53 **44 Claims**

1. In the process for the preparation of a vinyl chloride polymer comprising polymerizing in bulk in liquid phase vinyl chloride alone or in combination with up to 50% by weight based on the total weight of monomer of another ethylenically unsaturated monomer copolymerizable therewith, in the presence of a trunk polymer and a free radical initiator compound for said polymerization, wherein the trunk polymer is present during the polymerization only during the period which commences at 0% to about 20% conversion of the monomer or monomers to polymer and concludes with the end of the polymerization, the improvement which comprises employing as the trunk polymer about 0.05% to about 20% by weight, based upon said vinyl chloride monomer, of a trunk polymer consisting essentially of an olefin trunk polymer which is selected from the group consisting of:

(A) a homopolymer of an aliphatic hydrocarbon olefin monomer of 2 to 8 carbon atoms,

(B) a copolymer of two or more of said olefin monomers, and

(C) a polymer of at least one of said olefin monomers and no more than 15% by weight, based on the weight of the polymer, of a non-conjugated aliphatic hydrocarbon polyene of 4 to 18 carbon atoms wherein all of the carbon-to-carbon double bonds do not form a conjugated system,

said olefin polymer being soluble, partially soluble or dispersible in said monomer or monomers of the polymerization reaction, and said olefin polymer having a weight average molecular weight of about 50,000 to about 1,000,000.

4,163,034

POLYPHOSPHINITES AND A PROCESS FOR THEIR PREPARATION

Walter Dürsch; Fritz Linke, both of Königstein, and Manfred Finke, Fischbach, all of Fed. Rep. of Germany, assignors to Hoechst AG., Frankfurt am Main, Fed. Rep. of Germany

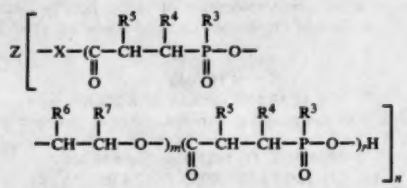
Division of Ser. No. 749,792, Dec. 13, 1976, Pat. No. 4,096,208. This application Jan. 23, 1978, Ser. No. 871,755

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1975, 2556482; Oct. 9, 1976, 2645786; Oct. 22, 1976, 2647745

Int. Cl.[2] C07F *9/32*

U.S. Cl. 260—931 3 Claims

1. Compounds of the general formula



I

in which

X is NR^1 with R^1 being hydrogen or $(C_1–C_4)$-alkyl,

R^3 is a $(C_1–C_4)$-alkyl group which may be substituted, preferably monosubstituted, by halogen, especially chlorine, a cylcoalkyl group having up to 8 carbon atoms, especially cyclopentyl, cyclohexyl, an alkenyl group having up to 4 carbon atoms, especially vinyl and allyl, a phenyl or benzyl group optionally substituted by halogen, preferably chlorine and/or bromine, and preferably carrying 1 to 3 substituents,

R^4 is hydrogen or a $(C_1–C_4)$-alkyl group, preferably methyl,

R^5 is hydrogen or a $(C_1–C_2)$-alkyl group, preferably methyl, with at least one of the radicals R^4 and R^5 preferably being hydrogen,

R^6 is hydrogen, methyl, chloromethyl,

R^7 is hydrogen, methyl or ethyl, preferably hydrogen,

m stands for numbers in the range of from 1 to 20, preferably from 2 to 20, especially from 2 to 6,

n stands for numbers in the range of from 1 to 6, preferably from 2 to 6,

r is 0 to 1, preferably 0,

Z is a n-valent radical of the group consisting of $C_1–C_{18}$ alkyl which may be interrupted by an amino group; phenyl which may be substituted by halogen atoms; benxyl; biphenyl or di-cyclohexylmethane.

4,163,035

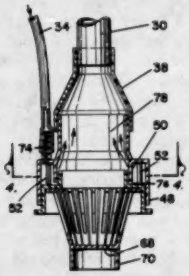
AQUARIUM WATER AERATION DEVICE

Egon Gorsky, 306 W. Dudley Ave., Westfield, N.J. 07090, assignor to Egon Gorsky, Westfield, N.J.

Filed Jan. 16, 1978, Ser. No. 869,576

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—77 10 Claims



1. In combination, a water tube and aerator apparatus comprising a tube having first and second ends and an aerator housing comprising an upper body member and a lower body member, said upper body member including a water chamber therein and connected to said second tube end, said lower body member having water inlet means, said upper body member having an interior wall surface and a first circumferential wall spaced from the interior wall surface and defining an air chamber therebetween, air inlet means in communication with said air chamber, said lower body member of said aerator housing having a second circumferential wall defining a passageway therethrough in communication with said water chamber, said second circumferential wall including a top edge and a surface disposed adjacent to said first circumferential wall of said upper body member to form a large plurality of axially extending air passages communicating with said air chamber and opening into said water chamber contiguous with the top edge of said second circumferential wall, whereupon air pumped into said air chamber passes through said passages to form a large plurality of minute air streams directed axially upward into said water chamber for sparging water therein and moving said water into said tube.

4,163,036

PROCESS FOR PRODUCING MINERAL WOOL FIBERS PROVIDED WITH A BINDER

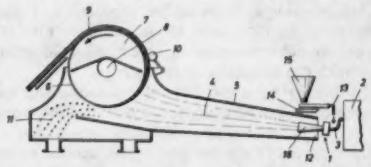
Wilhelm Ransmayr, and Heinz Mally, both of Linz, Austria, assignors to Vereinigte Oesterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Sep. 26, 1977, Ser. No. 836,608

Claims priority, application Austria, Sep. 30, 1976, 7279/76

Int. Cl.[2] B01J *2/02*

U.S. Cl. 264—12 4 Claims



1. A process of producing mineral wool fibers provided with a binder, which comprises

producing a stream of molten mineral material,

adding binder powder which is compatible with said mineral material to said stream in a predetermined proportion, and

jointly blasting said mineral material stream containing said binder powder through a blasting nozzle to form mineral wool fibers provided with said binder.

4,163,037

METHOD FOR MAKING THERMOPLASTIC FOAMS

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 669,028, Mar. 22, 1976, Pat. No. 4,097,425, and a continuation-in-part of Ser. No. 608,451, Aug. 28, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 886,726

Int. Cl.[2] B29H *7/20*

U.S. Cl. 264—54 8 Claims

1. A method for making a shaped thermoplastic foam which comprises,

(1) making a substantially uniform blend of a dihydrooxadiazinone and an organic thermoplastic polymer, where there is utilized from 0.1 to 1.0% by weight of dihydrooxadiazinone, based on the weight of the blend, and

(2) injection molding the blend at temperatures in the range of between about 170° C. to about 400° C.

4,163,038

FUMIGATING METHOD AND APPARATUS

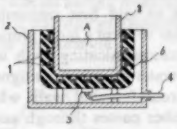
Akira Nishimura; Takanobu Kashihara; Fukuyasu Okuda, and Masanaga Yamaguchi, all of Ako, Japan, assignors to Earth Chemical Company, Limited, Hyogo, Japan

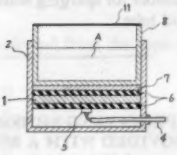
Filed Mar. 2, 1978, Ser. No. 882,921

Claims priority, application Japan, Mar. 3, 1977, 52/23475; Apr. 20, 1977, 52/45585; May 13, 1977, 52/61975[U]

Int. Cl.[2] A61L *1/00, 3/00;* **A01M** *13/00*

U.S. Cl. 422—36 **16 Claims**





1. A fumigating method comprising heating a mixture of an active ingredient and a blowing agent indirectly with a heating element capable of evolving heat by application of an electric current or a heating element capable of evolving heat by contact with air to thermally decompose the blowing agent without entailing combustion and to volatilize the active ingredient, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas and contacting an object, material or area to be treated with the so-generated fumigant.

11. A fumigating apparatus for practicing the method as defined in claim 1 comprising accommodated therein a mixture of an active ingredient and a blowing agent, and a heating element capable of evolving heat by application of an electric current, the mixture and the heating element being separated from each other by a partition interposed therebetween and providing a heat transfer surface, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas.

14. A fumigating apparatus for practicing the method as defined in claim 1 comprising accommodated therein a mixture of an active ingredient and a blowing agent, and a heating element capable of evolving heat by contact with air, the mixture and the heating element being separated from each other by a partition interposed therebetween and providing a heat transfer surface, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas.

4,163,039

DIAGNOSTIC MEANS FOR THE RAPID DETECTION OF MUCOVISCIDOSIS

Hinderk M. Emrich, Lortzingsstrasse 16, D-8011 Vaterstetten, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,556

Int. Cl.[2] G01N *33/16*

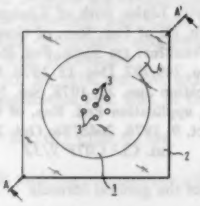
U.S. Cl. 422—56 **12 Claims**

1. Diagnostic means for the rapid detection of mucoviscidosis, comprising

(1) an absorbent sheet,

(2) an indicator associated with said sheet, said indicator producing a color change when the diagnostic means is contacted by a subject's sweat having a concentration of sodium or chloride ions of at least 50 meq./l; and

(3) a transparent envelope which envelops the indicator-associated sheet, said envelope being perforated on one



surface to permit absorption of sweat directly from the skin surface of the subject into said absorbent sheet.

4,163,040

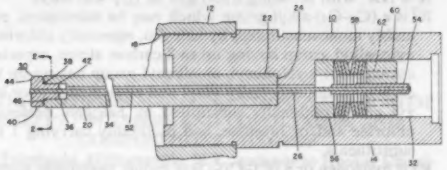
CATALYST SPRAY NOZZLE

Henri A. Van den Bossche, Antwerp, Belgium, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,601

Int. Cl.[2] B01J *3/04;* **B05B** *1/32;* **C08F** *110/02*

U.S. Cl. 422—131 **1 Claim**



1. In a high pressure reactor for polymerizing ethylene into polyethylene, the improvement comprising a liquid catalyst injection nozzle for injecting a finely atomized spray of liquid catalyst into the reactor, said nozzle comprising:

(a) an injector housing having therein an injection passageway with a discharge end through which liquid catalyst is injected into the reactor, said injection passageway comprising a first cylindrical portion proximate the discharge end of said passageway, and a second cylindrical portion having a larger diameter than said first portion of the injection passageway, said housing at said discharge end having a flat, radially oriented annular surface;

(b) a valve element for closing the discharge end of said passageway comprising a first section having a substantially cylindrical shape which is positioned within said first cylindrical portion of said passageway and having a plurality of flats formed in the cylindrical outer wall of the first section, said flats extending axially along the first portion of the passageway to permit liquid catalyst to flow axially through gaps formed between the first cylindrical portion of the injection passageway and the flats on the first section of the valve element, and a second cylindrical section having a larger diameter than said first section, with an annular shoulder being formed at the juncture of said sections, said annular shoulder being arranged at the discharge end of said injection passageway, the surface of said annular shoulder being complementary to said flat, radially-oriented annular surface on said housing and adapted to close thereagainst;

(c) means mounted entirely within said housing for normally biasing said complementary surface of said valve element into closing engagement with said annular surface at the discharge end of said passageway with a predetermined force including a plurality of belleville spring washers arranged coaxially within said second cylindrical portion of the injection passageway;

(d) a rod extending axially through said injection passageway and through said belleville washers and being con-

nected at one end to said first cylindrical section of the valve element and at the other end to said belleville spring washers for biasing the annular shoulder of the valve element against the discharge end of said injection passageway, said rod including an external threaded portion at the end portion thereof adjacent the washers, and a nut having internal threads threadedly engaged with the external threads on said threaded portion of the rod, said nut being mounted on said rod and bearing against the belleville washer located axially remotest from the discharge end of said injection passageway, said nut being adapted to be adjustably screwed onto the rod for selectively adjusting said predetermined force biasing the annular shoulder of the valve element against the discharge end of the injection passageway, a plurality of axial holes in said nut extending therethrough to allow for the flow of liquid catalyst through said passageway; and

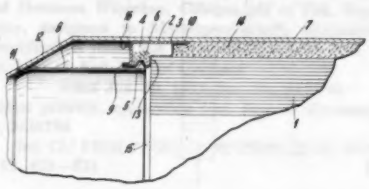
(e) means for enabling the liquid catalyst to be supplied to said injection passageway at a pressure in excess of and opposite to the predetermined force of said biasing means to bias said valve element away from engagement with the discharge end of said injection passageway and facilitate liquid catalyst to be expelled through the space therebetween, atomizing said liquid catalyst and causing said catalyst to be injected into the reactor as an atomized spray.

4,163,041

SUPPORT FOR ELASTICALLY MOUNTING A CERAMIC HONEYCOMB CATALYST

Gerhard Gaysert, Esslingen, Fed. Rep. of Germany, assignor to J. Eberspacher, Esslingen, Fed. Rep. of Germany

Filed May 29, 1974, Ser. No. 474,163
Int. Cl.[2] F01N *3/15*; B01J *35/04, 8/02*
U.S. Cl. 422—179 **8 Claims**



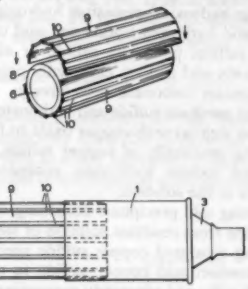
1. A catalyst support arrangement comprising an axially extending ceramic, honeycomb catalyst having a first end and a second end each extending transversely of the axis thereof, an axially extending tubular housing laterally enclosing said catalyst and arranged to be traversed by the exhaust gases of an internal combustion engine so that the exhaust gases flow axially through said housing and over said honeycomb catalyst, said housing having an inner surface, at least one ring-shaped holding member mounted within the housing adjacent the first end of said catalyst with the axis thereof extending in generally parallel relation with the axis of said housing, wherein the improvement comprises that said holding member has an axially extending inner wall spaced radially inwardly from the inner surface of said housing, an axially extending outer wall spaced radially outwardly from said inner wall, a first end wall extending transversely of the radially inner and outer walls and located between the first end and second end of said catalyst and a second end wall spaced from said first end wall and extending transversely of said radially inner and outer walls with said second end wall spaced axially outwardly from the first end of said catalyst and with said inner and outer walls and said first and second end walls defining a closed generally box-shaped cavity, said holding member includes an annular rigid holding angle having a first leg extending in the axial direction of said housing and a second leg extending transversely of the axial direction of said housing with said second leg extending radially inwardly from said first leg and said second leg forming said second end and said first leg forming said outer wall, and a molded part formed of a soft flexible material and forming said inner wall and said first end, said molded part secured to said second leg of said holding angle and disposed in sliding contact with said first leg of said holding angle and said molded part forming a shoulder extending transversely of the axial direction of said housing and elastically supporting the first end of said catalyst.

4,163,042

CONTAINERS FOR CATALYSTS FOR EXHAUST EMISSION CONTROL

John H. Lynch, St. Annes-on-Sea, England, assignor to T.I. Silencer Services Limited, Lancashire, England

Filed Jan. 14, 1974, Ser. No. 433,371
Claims priority, application United Kingdom, Jan. 13, 1973, 1879/73; Aug. 3, 1973, 37064/73
Int. Cl.[2] B01J *8/00*; F01N *3/15*
U.S. Cl. 422—179 **5 Claims**



1. A container assembly for an exhaust emission control catalyst comprising a cylindrical substrate body carrying said catalyst and having a cylindrical surface and two end faces designed for exhaust gas flow from one of said end faces to the other, a compressible resilient cushioning layer surrounding the cylindrical surface of said body, an open-seam sheet metal shroud surrounding said cushioning layer, said shroud, by virtue of the open seam, being of variable circumference and being thereby compressible around said cushioning layer, said shroud having formed in the wall thereof a plurality of outwardly projecting circumferentially spaced ribs, and a cylindrical sheet metal casing of fixed circumferential dimensions, in which said substrate, enclosed in said cushioning layer and said shroud, is received, with said ribs on said shroud making line contact with the inner surface of said casing and the remainder of said shroud being spaced away from said casing, the circumferential dimensions of said casing being such that said cushioning layer is under compression by the action of said shroud.

5. A method of assembling a cylindrical body of a monolithic substrate carrying an exhaust emission control catalyst into a cylindrical housing of fixed circumferential dimension comprising the steps of wrapping a resilient cushioning layer around the cylindrical surface of said body, enclosing the wrapped cushioning layer in an open-seam sheet metal substantially cylindrical shroud, said shroud being of variable circumferential extent by virtue of said open-seam and said shroud having formed thereon a plurality of circumferentially spaced outwardly projecting longitudinally extending ribs, each of said ribs tapering to zero at one end of said shroud, the housing and layer of cushioning material being selected that the resulting assembly of said substrate body, layer of cushioning material and shroud has a greater circumferential dimension than said housing, squeezing said shroud such as to compress said cushioning layer until the circumferential dimension of said shroud at least at the end where the ribs taper to zero is less than the circumferential dimension of said housing, inserting said end into said housing, and thereafter exerting an axial force on said assembly until it comes to rest within said housing

with said ribs resiliently urged into line contact with the inner surface of said housing by the resilience of said cushioning layer.

4,163,043

PROCESS FOR REMOVING H_2S AND CO_2 FROM GASES AND REGENERATING THE ADSORBING SOLUTION

Claude Dezael, Maisons Laffitte; André Deschamps, Noisy le Roi, and Sigismond Franckowiak, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 24, 1978, Ser. No. 889,803
Claims priority, application France, Mar. 25, 1977, 77 09255
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—234 **10 Claims**

1. A process for selectively desulfurizing a gas containing both hydrogen sulfide and carbon dioxide with sulfur dioxide production, which process comprises the steps of:

(a) contacting said gas with an aqueous absorption solution of sodium hydroxide, potassium hydroxide or ammonia to absorb said hydrogen sulfide and said carbon dioxide as sodium sulfide, potassium sulfide or ammonium sulfide respectively and sodium carbonate, potassium carbonate or ammonium carbonate, respectively;

(b) reacting resultant sulfide and carbonate-containing solution from step (a) with copper oxide to form a precipitate consisting essentially of copper sulfide, and to produce additional sodium hydroxide, potassium hydroxide or ammonia in the solution;

(c) separating said precipitate consisting essentially of copper sulfide from resultant solution of step (b);

(d) roasting separated copper sulfide precipitate from step (c) to convert said copper sulfide to copper oxide and sulfur dioxide, and separately recovering resultant copper oxide and a sulfur dioxide containing gas;

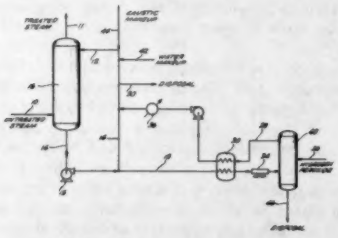
(e) recycling resultant copper oxide from step (d) to step (b) as said copper oxide, and (f) recycling separated solution from step (c) to step (a) as said aqueous absorption solution.

4,163,044

METHOD FOR REMOVING HYDROGEN SULFIDE FROM STEAM

Byron B. Woertz, Claremont, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 25, 1977, Ser. No. 854,486
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—234 **13 Claims**



1. A process for continuously treating hydrogen sulfide-containing steam to reduce the hydrogen sulfide content of the steam, comprising:

(a) contacting said hydrogen sulfide-containing steam in a contacting stage with an aqueous alkaline solution comprised of a water-soluble alkali metal hydroxide so as to absorb hydrogen sulfide from said steam and produce a treated steam having a reduced hydrogen sulfide content, said solution being introduced into contacting stage at a temperature between about 212° F. and 700° F. which is about the temperature of the steam entering said contacting stage;

(b) withdrawing said aqueous, alkaline solution containing absorbed hydrogen sulfide from said contacting stage;

(c) introducing hydrogen peroxide into at least a portion of said aqueous alkaline solution containing absorbed hydrogen sulfide to effect a reduction in the sulfide content of the solution and form a treated solution containing environmentally harmless reaction products, said portion of said aqueous solution to which said hydrogen peroxide is introduced being at a temperature which substantially prevents thermal decomposition of the hydrogen peroxide introduced thereinto;

(d) heating said treated solution to about the temperature of the steam entering the contacting stage; and

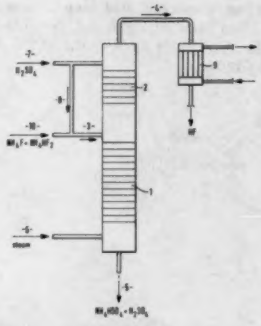
(e) recycling said heated, treated solution to said contacting stage to provide at least a portion of said aqueous alkaline solution introduced thereinto.

4,163,045

PROCESS FOR PRODUCING HYDROGEN FLUORIDE FROM AN AQUEOUS SOLUTION OF HYDROGEN FLUORIDE AND SULFURIC ACID

Arie Van der Meer, Helsinki, and Lauri A. Lepomaa, Espoo, both of Finland, assignors to Kemira OY, Helsinki, Finland

Filed Dec. 15, 1977, Ser. No. 860,971
Claims priority, application Finland, Dec. 27, 1976, 763707; Dec. 27, 1976, 763708
Int. Cl.[2] C01B *7/22*
U.S. Cl. 423—483 **2 Claims**



1. A process for separating hydrogen fluoride from an aqueous solution of hydrogen fluoride and sulfuric acid, comprising stripping the aqueous solution of hydrogen fluoride and sulfuric acid by steam in a separation zone; passing hydrogen fluoride released in said steam stripping through a drying zone and contacting it in the drying zone with a batch of strong sulfuric acid in order to produce generally water-free hydrogen fluoride of a desired concentration; and passing the sulfuric acid from the drying zone to the separation zone, said steam being absorbed substantially in the sulfuric acid.

4,163,046

RECOVERY OF SELENIUM

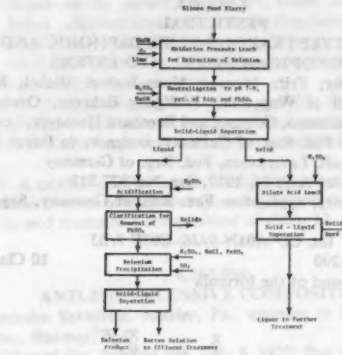
Kohur N. Subramanian; Alexander Illis, both of Mississauga, and Norman C. Nissen, Oakville, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,384
Claims priority, application Canada, May 24, 1977, 279062
Int. Cl.[2] C01B *19/00*
U.S. Cl. 423—510 **11 Claims**

1. A process for recovery of selenium from anode slimes containing selenium comprising:

(a) subjecting such slimes to a caustic oxidative leach to convert selenium values to the hexavalent form;

(b) neutralizing the product of the caustic leach with sulfuric acid to a pH of about 7 to about 9 with subsequent separation of the leach residue from the neutralized caustic leach solution;



(c) acidifying the separated neutralized leach solution with sufficient sulfuric acid to provide an acidified solution containing about 100 to about 200 grams per liter of sulfuric acid, and

(d) clarifying the resultant solution to obtain a further purified selenium-containing solution.

4,163,047

PROCESS FOR PRODUCING SULFURIC ACID FROM WASTE ACID AND IRON SULFATE

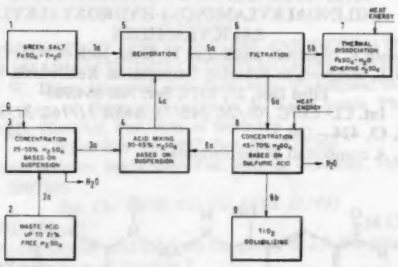
Karl-Heinz Dörr, Mainz; Georg Daradimos, Maintal; Hugo Grimm; Georg Schmidt, both of Frankfurt am Main; Rudolf Gerken, Krefeld-Traar; Christoph Mücke, Krefeld-Bockum, and Hermann Wieschen, Cologne, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,798

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630196

Int. Cl.[2] C01B *17/90, 17/50;* **C01G** *23/00, 49/02*

U.S. Cl. 423—531 **11 Claims**



1. A process for the recovery of sulfuric acid from waste sulfuric acid containing iron sulfate and from solid iron sulfate of high water content of crystallization which consists essentially of:

A. concentrating waste sulfuric acid to an acid concentration of 25–55 weight percent, based upon the suspension, by removing water therefrom;

B. mixing the concentrated acid of Step A with recycled concentrated sulfuric acid obtained from Step E to form a resultant acid mixture of acid concentration of 30–65 weight percent, based upon the suspension;

C. adding said solid iron sulfate of high water content of crystallization to the acid mixture of Step B thereby obtaining iron sulfate of low water content of crystallization;

D. separating the iron sulfate of low water content from the resultant sulfuric acid solution of Step C;

E. concentrating the separated sulfuric acid solution of Step D to an acid concentration of 45–70 weight percent, based on salt-free acid, and recycling at least a portion thereof to Step B; and

F. thermally decomposing the iron sulfate from Step D to produce iron oxide and sulfur dioxide.

4,163,048

ACYLAMINO-1,2,4-OXADIAZOLE OR THIADIAZOLE DERIVATIVES AS ANTI-HYPERSENSITIVITY AGENTS

William J. Ross, Lightwater; John P. Verge, Henley-on-Thames, and William R. N. Williamson, Slough, all of England, assignors to Lilly Industries Limited, London, England

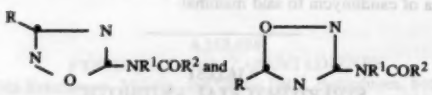
Division of Ser. No. 691,952, Jun. 1, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,943

Claims priority, application United Kingdom, Jun. 5, 1975, 24224/75

Int. Cl.[2] A61K *31/42, 31/425*

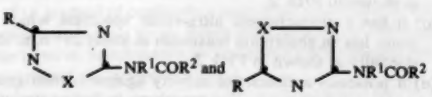
U.S. Cl. 424—45 **6 Claims**

1. A pharmaceutical formulation for the treatment of an immediate hypersensitivity condition of the type represented by asthma, comprising as active ingredient a chemotherapeutically-effective amount of a compound selected from the group consisting of:



wherein R is C_{1-4} haloalkyl, C_{1-4} alkyl, C_{3-10} cycloalkyl, or halogen; R^1 is C_{1-10} alkyl, 2-propenyl, C_{3-6} alkynyl, C_{2-6} alkoxyalkyl, C_{2-6} carboxyalkyl, C_{1-6} haloalkyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl or optionally R^3-substituted phenyl-C_{1-6} alkyl; R^2 is C_{1-8} alkyl, C_{1-6} haloalkyl, C_{2-6} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl, optionally R^3-substituted phenyl, optionally R^3-substituted phenyl-C_{1-6} alkyl or optionally R^3-substituted phenyl-C_{2-6} alkenyl; and R^3 is halogen, trifluoromethyl, C_{1-4} alkyl, C_{1-4} alkoxy or nitro; provided that when R^1 is C_{3-6} alkynyl, the —C≡C— group cannot be directly adjacent to the nitrogen; in admixture with a pharmaceutically acceptable carrier therefor.

4. A method of treating an animal suffering fro or susceptible to an immediate hypersensitivity condition of the type represented by asthma which comprises administering to the animal a chemotherapeutically effective amount of a compound selected from the group consisting of:



wherein X is O or S; R is C_{1-4} alkyl, C_{3-10} cycloalkyl, optionally R^3-substituted phenyl or halogen; R^1 is C_{1-10} alkyl, 2-propenyl, C_{2-6} alkoxyalkyl, C_{2-6} carboxyalkyl, C_{1-6} haloalkyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl or optionally R^3-substituted phenyl-C_{1-6} alkyl; R^2 is C_{1-8} alkyl, C_{1-6} haloalkyl, C_{2-6} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl, optionally R^3-substituted phenyl, optionally R^3-substituted phenyl-C_{1-6} alkyl or optionally R^3-substituted phenyl-C_{2-6} alkenyl; and R^3 is halogen, trifluoromethyl, C_{1-4} alkyl, C_{1-4} alkoxy or nitro; provided that: when X is O; R is phenyl and R^2 is methyl, R^1 cannot be methyl or benzyl.

4,163,049

COMPOSITION ACTIVE WITH RESPECT TO ERYTHEMA SOLARE

Michel F. Aubin, Fougeres Agris, France, assignor to Societe d'Etudes et de Participation O.H.F., Asnieres, France

Filed May 6, 1977, Ser. No. 794,588
Claims priority, application France, May 6, 1976, 76 13599
Int. Cl.[2] A61K *7/42, 35/64, 35/78*
U.S. Cl. 424—59 7 Claims

1. A composition active with respect to erythema solare, which comprises synergistic a mixture of tinctures of *Apis mellifica* at a dilution of from 4° CH to 15° CH and Calendula at a dilution of from a third decimal to 9° CH.

4,163,050

METHOD OF TREATING HYPERCHOLESTEROLEMIA WITH CANDIMYCIN

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Division of Ser. No. 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, which is a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application May 9, 1977, Ser. No. 794,920
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—115 3 Claims

1. A process for treating hypercholesterolemia in a large mammal in need of said treatment which comprises orally administering an effective dose for treating hypercholesterolemia of candimycin to said mammal.

4,163,051

STREPTOMYCETAL ANTIBIOTIC

Stephen J. Box, Horsham, and John D. Hood, Cranleigh, both of England, assignors to Beecham Group Limited, Great Britain

Continuation-in-part of Ser. No. 716,971, Aug. 23, 1976, abandoned, which is a division of Ser. No. 664,917, Mar. 8, 1976, abandoned. This application Sep. 23, 1976, Ser. No. 725,864
Claims priority, application United Kingdom, Mar. 15, 1975, 10914/75
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—124 9 Claims

1. A process for the preparation of the di-sodium or di-potassium salf of MM 17880 which is at least 75% pure wherein MM 17880 is a di-acidic solid of the molecular formula $C_{11-14}H_{18-25}O_{8-11}N_2S_2$ which in the form of a substantially pure di-sodium salt has the following characteristics:

(a) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infrared spectrum substantially as shown in FIG. 1;

(b) it has a characteristic nuclear magnetic resonance spectrum which when taken in deuterium oxide is substantially as shown in FIG. 2;

(c) it has a characteristic ultra-violet spectrum which in water has an absorption maximum at about 297 n.m. substantially as shown in FIG. 3;

(d) it possesses antibacterial activity against certain gram-positive and gram-negative organisms, including strains of *Bacillus subtilis, Enterobacter cloacae, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhimurium, Serratia marcescens* and *Staphylococcus aureus;* and

(e) when mixed with ampicillin or amoxycillin, it synergizes their antibacterial activity against certain bacteria, including strains of *Staphylococcus aureus* and *Klebsiella aerogenes;*

which comprises chromatographically purifying a solution of MM 17880 by passing said solution in an aqueous lower alkanol through a bed containing a recoverable amount of cellulose, collecting those fractions having a UV absorption maximum at about 297 nm and removing the solvent from the solution thereby obtaining the di-sodium or di-potassium salt of MM 17880 in at least 75% purity.

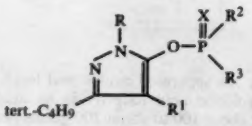
4,163,052

PESTICIDAL O-[3-T-BUTYLPYRAZOL-5-YL]PHOSPHORIC AND THIONOPHOSPHORIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Rolf Schröder, all of Wuppertal; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,512
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639258
Int. Cl.[2] A01N *9/36;* C07F *9/65*
U.S. Cl. 424—200 10 Claims

1. A compound of the formula



in which

R is hydrogen, alkyl with 1 to 4 carbon atoms, cyanoalkyl with 1 to 4 alkyl carbon atoms, or phenyl optionally carrying at least one halogen, or halogenoalkyl, alkyl or alkylthio substituent wherein the alkyl has up to 4 carbon atoms,

R^1 is hydrogen, halogen, or alkyl or alkylthio with 1 to 6 carbon atoms.

R^2 is alkoxy or alkyl with 1 to 8 carbon atoms, or phenyl,

R^3 is alkoxy with 1 to 6 carbon atoms, and

X is oxygen or sulphur.

9. A method of combating arthropods, nematodes or fungi which comprises applying to such arthropods, nematodes or fungi or to a habitat thereof an arthropodicidally, nematicidally or fungicidally effective amount of a compound according to claim 1.

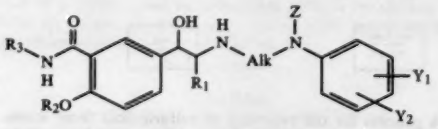
4,163,053

ANTI-HYPERTENSIVE 5-[2-(SUBSTITUTED ANILINOALKYLAMINO)-1-HYDROXYALKYL]-SALICYLAMIDES

Bernard R. Neustadt, and Elijah H. Gold, both of West Orange, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 27, 1977, Ser. No. 864,983
Int. Cl.[2] C07C *103/26, 143/75;* A61K *31/165, 31/18*
U.S. Cl. 424—230 22 Claims

1. A compound of the formula



(I)

wherein

R_1 is hydrogen or lower alkyl;

R_2 is hydrogen, lower alkyl, lower alkoxy(lower)alkyl, or hydroxy(lower)alkyl;

R_3 is hydrogen or lower alkyl;

Alk is an acyclic or cyclic alkylene bridge containing 2–10 carbon atoms, with the proviso that there are 2–6 carbonatoms separating the nitrogen atoms;

Z is hydrogen, lower alkyl, lower alkanoyl, lower alkylsul-

fonyl, arylsulfonyl, lower alkoxy(lower)alkyl or 2,2,2-trifluoroethyl;

Y_1 and Y_2 are independently hydrogen, halogen, hydroxy, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino, mono- or di- (lower)alkylamino, lower alkanoylamino, lower alkylsulfonylamino, arylsulfonylamino, N-lower alkyl-N-lower alkanoylamino, or N-lower alkyl-N-lower alkylsulfonylamino; and the pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition useful in the treatment of hypertension containing an antihypertensive amount of a compound of claim **1** together with a pharmaceutical carrier therefor.

17. A method of effecting an antihypertensive response om a mammal in need of such therapy which comprises administering to said mammal a composition of claim **12**.

4,163,054

ANTI-HYPERTENSIVE COMPOSITIONS

Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 766,635, Feb. 8, 1977, Pat. No. 4,086,354, which is a division of Ser. No. 657,825, Feb. 13, 1976, Pat. No. 4,055,645. This application Oct. 12, 1977, Ser. No. 841,269

Int. Cl.[2] A61K *31/33, 31/15*

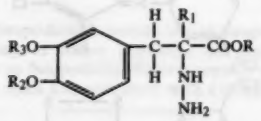
U.S. Cl. 424—244 **8 Claims**

1. A pharmaceutical composition for treating hypertension containing an effective amount of

(a) guanethidine or a pharmaceutically acceptable salt thereof, and

(b) racemic mixture of L-isomer of a hydrazino phenyl propionic acid decarboxylase inhibitor wherein the weight ratio of (b):(a) is 40:1 or less.

2. The pharmaceutical composition of claim **1** wherein said decarboxylase inhibitor has the formula:



wherein R, R_1, R_2 and R_3 are independently selected from hydrogen or C_1–C_4-alkyl, and pharmaceutically acceptable salts thereof.

4,163,055

2,9-DIOXATRICYCLO[4,3,1,$0^{3,7}$] DECANE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Peter W. Thies, Hanover, and Akiji Asai, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

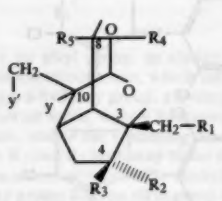
Filed Feb. 18, 1977, Ser. No. 770,055

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607106

Int. Cl.[2] C07D *405/06;* **A61K** *31/445*

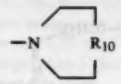
U.S. Cl. 424—267 **18 Claims**

1. A compound selected from the group of 2,9-dioxatricyclo [4,3,$0^{3,7}$] decanes of formula I



(I)

wherein R_1 represents a group of the formula



wherein R_{10} represents a bond or alkylene containing 1 to 3 carbon atoms or the group of the formula

one of R_2 and R_3 is hydrogen and the other represents hydroxy, an acyloxy group Z—COO— wherein Z is alkyl or alkenyl containing 1 to 4 carbon atoms or phenyl, or a carbamyloxy group Z—NHCOO— wherein Z is alkyl or alkenyl containing 1 to 4 carbon atoms or phenyl, or R_2 and R_3 jointly represent oxygen;

one of R_4 and R_5 is hydrogen and the other represents alkoxy containing 1 to 6 carbon atoms or benzyloxy;

and y and y′ each represent hydrogen or jointly form a bond;

and pharmaceutically-acceptable acid addition salts thereof.

10. A pharmaceutical composition comprising an inert carrier material and a sedatively or soporifically effective amount of a compound as defined in claim **1**.

4,163,056

PESTICIDAL TRIAZAPENTADIENES

Odd Kristiansen, Möhlin, and Dieter Dürr, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

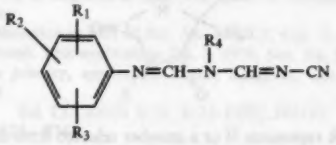
Filed Sep. 25, 1978, Ser. No. 945,673

Claims priority, application Switzerland, Sep. 29, 1977, 11911/77

Int. Cl.[2] A01N *9/20;* **C07C** *125/08*

U.S. Cl. 424—324 **7 Claims**

1. A triazapentadiene of the formula



in which R_1, R_2 and R_3 are each hydrogen, halogen, C_1–C_3 alkyl or trifluoromethyl, and R_4 is C_1–C_4 alkyl.

7. A method of combatting pests of the class Insecta or of the order Acarina at a locus, which method comprises applying to the locus an insecticidally or acaricidally effective amount of a compound as claimed in claim **1**.

4,163,057

ISOXAZOLE-4-CARBOXAMIDES AS TRANQUILIZERS, SLEEP-INDUCERS AND MUSCLE RELAXANTS

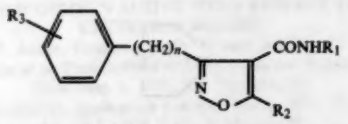
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Dec. 27, 1977, Ser. No. 864,380

Int. Cl.[2] A61K *31/42;* **C07D** *261/14, 261/10*

U.S. Cl. 424—272 **9 Claims**

1. A compound of the formula



where

R_1 is hydrogen or lower alkyl having 1 to 4 carbon atoms, and

R_2 is hydrogen or straight chain lower alkyl having 1 to 4 carbon atoms, and

R_3 is hydrogen, fluoro, chloro, lower alkoxy having 1 to 4 carbon atoms or trifluoromethyl,

and

n is 1, 2, 3 or 4.

9. A pharmaceutical composition which comprises a pharmacologically effective amount of a compound of claim **1** and a pharmaceutically acceptable diluent or carrier therefor.

4,163,058

DERIVATIVES OF 5,5-DIPHENYLHYDANTOIN EXHIBITING ENHANCED SOLUBILITY AND THE THERAPEUTIC USE THEREOF

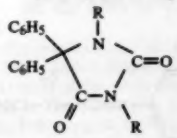
Valentino J. Stella, Lawrence, and Kenneth B. Sloan, Eudora, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Apr. 22, 1977, Ser. No. 790,087

Int. Cl.[2] A61K *31/415*; C07D *233/74*

U.S. Cl. 424—273 R **13 Claims**

1. A 5,5-diphenylhydantoin compound having the formula:



wherein R represents H or a member selected from the group consisting of

wherein R_1 represents a member selected from the group consisting of H and C_1–C_7 straight or branched alkyl; wherein X is —O— or —S—; and wherein R_2 represents

wherein R_4 is an acyl residue of any naturally occurring protein amino acid; with the proviso that R in both occurrences cannot represent H simultaneously; or the pharmaceutically acceptable acid addition or basic salts, C_1–C_4 alkylhalide quaternary salts or N-oxide thereof.

4,163,059

PESTICIDALLY ACTIVE 4,5-DICHLORO-3-SUBSTITUTED-PHENYLIMINO-1,2-DITHIOLENES

Edgar Enders; Ingeborg Hammann; Wilhelm Brandes; Peter Kraus, all of Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

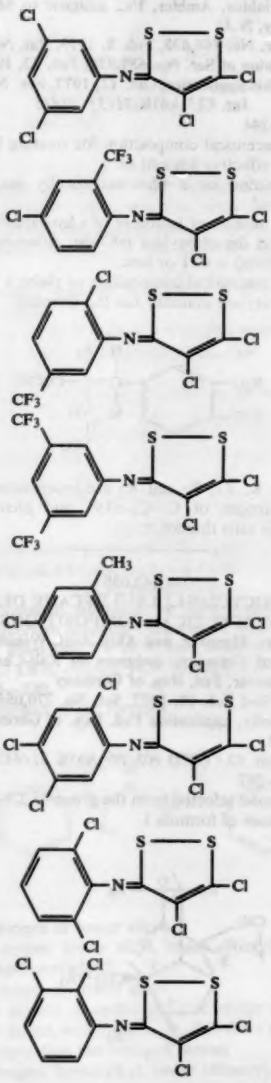
Filed Aug. 15, 1977, Ser. No. 824,940

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637692; Feb. 19, 1977, 2707227

Int. Cl.[2] A61K *31/385*; C07D *339/02*

U.S. Cl. 424—277 **15 Claims**

1. A compound selected from the group consisting of



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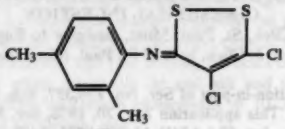
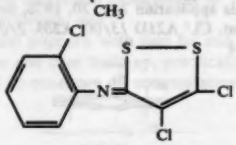
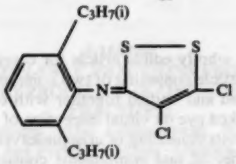
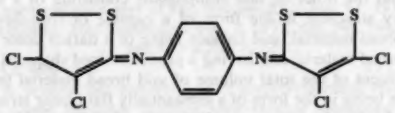
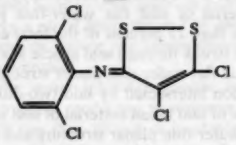








and



14. An arthropodicidal, nematicidal or fungicidal composition containing as active ingredient an arthropodicidally, nematicidally or fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,163,060

ARALKYLAMINO CARBOXYLIC ACIDS AND DERIVATIVES HAVING SPASMOLYTIC ACTIVITY

Jan Hartog, and Johannes M. A. Zwagemakers, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

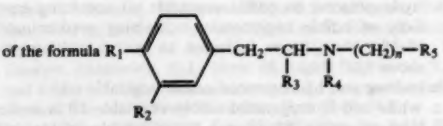
Division of Ser. No. 564,789, Apr. 3, 1975, Pat. No. 4,034,103. This application Jan. 17, 1977, Ser. No. 759,798

Claims priority, application Netherlands, Apr. 8, 1974, 7404732

Int. Cl.[2] A61K *31/275;* **C07C** *101/16, 103/28, 121/78*

U.S. Cl. 424—278 **28 Claims**

1. Compounds of



wherein R_1 is an alkyl group, an alkoxy group, an alkylthio group or a dialkylamino group, which substituents have up to 2 carbon atoms, a hydroxy group, a hydrogen atom, a chlorine atom or a fluorine atom, R_2 is a hydrogen atom or, if R_1 is a hydrogen atom, one of the remaining substituents summed up for R_1, while R_1 and R_2 both may be an alkoxy group having 1 or 2 carbon atoms or together a methylene dioxy group or ethylene dioxy group; R_3 is an alkyl group having 1 or 2 carbon atoms; R_4 is an alkyl group having 1 to 3 carbon atoms; n is an integer from 3 to 20 and R_5 is a group $COOR_6$, wherein R_6 is a hydrogen atom, an ethyl group or a propyl group, a group $CONR_7R_7'$, wherein R_7 and R_7' which may be equal or different, each is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms or a group CN providing that when R_6 is a hydrogen atom, n is larger than 5 and salts thereof formed with pharmaceutically acceptable acids.

26. A spasmolytic composition comprising, in a spasmolytically effective amount, a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,163,061

3-PHENYL-2-THIOXO-2H,5H-PYRANO[3,2-c][1]BENZOPYRAN-5-ONE DERIVATIVES, A PROCESS OF MAKING AND A METHOD OF USING THEM AS RODENTICIDES

Erik Frandsen, Hoejby, Denmark; Gottfried Bohtz, Basel, and Günter Mattern, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

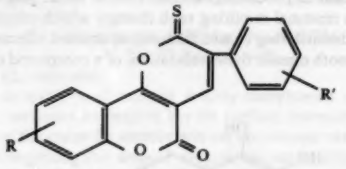
Filed Apr. 17, 1978, Ser. No. 896,958

Claims priority, application Switzerland, Apr. 21, 1977, 4955/77

Int. Cl.[2] A01N *9/28;* **C07D** *311/08*

U.S. Cl. 424—279 **9 Claims**

1. A 3-phenyl-2-thioxo-2H,5H-pyrano[3,2-c][1]benzopyran-5-one of the formula I



(I)

wherein each of R and R′ independently represents hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen.

4,163,062

FUNGICIDAL BENZALDEHYDE-N-FORMYL-PHENYLHYDRAZONES

Michael T. Clark, Sittingbourne, and Pieter ten Haken, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

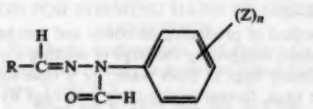
Continuation-in-part of Ser. No. 838,772, Oct. 3, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,652

Claims priority, application United Kingdom, Oct. 5, 1976, 41300/76

Int. Cl.[2] A01N *9/20, 9/24;* **C07C** *103/10*

U.S. Cl. 424—324 **5 Claims**

1. A compound, being one of ten having the formula:



(I)

the ten being individual species wherein the substituent moieties are as follows, the number preceding the moiety, Z, indicating the position of that moiety on the phenyl ring:

R	N	Z
phenyl	1	4-Cl
4-methoxyphenyl	0	—
4-chlorophenyl	0	—
4-fluorophenyl	0	—
4-bromophenyl	0	—
4-methylphenyl	0	—
3-fluorophenyl	0	—

-continued

R	N	Z
3-methylphenyl	0	—
4-methylphenyl	1	4-F
4-(isopropyl)phenyl	0	—

3. A method for killing unwanted fungi on plants which comprises subjecting such fungi to a fungicidal amount of a compound of claim 1.

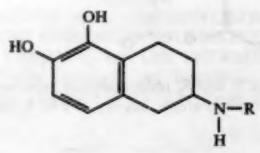
4,163,063

AMINOTETRALIN ADRENERGIC β-AGONISTS

Joseph G. Cannon, and John P. Long, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jan. 2, 1976, Ser. No. 646,300
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 **8 Claims**

1. A method of producing smooth muscle tissue relaxation therapy in a mammal requiring such therapy which comprises internally administering to said mammal an amount effective to produce smooth muscle tissue relaxation, of a compound of the formula:



wherein R is alkyl having from 1 to 6 carbon atoms.

4,163,064

METHOD OF PRODUCING DRIED, DE-SHELLED BRINE SHRIMP CYSTS

Marjorie M. Hill, 9903 Candia Dr., Whittier, Calif. 90603

Filed Mar. 6, 1978, Ser. No. 884,067
Int. Cl.[2] A01K *61/00*; A23L *1/325*
U.S. Cl. 426—2 **9 Claims**

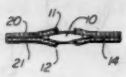
6. The method of producing an edible and hatchable aquaculture product, comprising the steps of soaking a quantity of dry brine shrimp eggs in fresh water for a time sufficient to saturate the eggs, thereafter denuding said eggs by adding a solution of sodium hypochlorite to said fresh water in sufficient quantity to provide an alkaline medium capable of dissolving the outer shells of said water-soaked eggs and retaining said eggs in said medium for a time sufficient to dissolve the outer shells of said eggs, agitating the eggs in said medium while maintaining the temperature of said medium below 40° C. during the dissolving of said shells, separating the resultant denuded cysts from said medium by pouring said mixture of cysts and medium through a fine mesh, rinsing the separated denuded cysts in an acidic liquid to neutralize any residual alkaline medium thereon, and thereafter drying said denuded cysts while maintaining the temperature of said cysts below 40° C.

4,163,065

EDIBLE INTERLOCKED COMPONENTS FOR CEREMONIAL INGESTION

Wallace F. Cilek, St. Paul, Minn., assignor to Eugene T. Cilek and Gregory J. Cilek, both of St. Paul, Minn., part interest to each

Continuation-in-part of Ser. No. 770,397, Feb. 22, 1977, abandoned. This application Apr. 20, 1978, Ser. No. 898,451
Int. Cl.[2] A21D *13/00*; A23L *2/02*
U.S. Cl. 426—94 **9 Claims**



1. A storable wholly edible article for ceremonial religious ingestion, said article consisting of two components of discrete shape interlocked and unified together with each component visible to the naked eye on visual inspection of said article, one of said components consisting of crisp unleavened bread material and the other of said components consisting of a single unitary structure in the form of a capsule of fruit-flavored non-bread material, said capsule being of a darker color than said bread material and having a predetermined shape, at least 80 percent of the total volume of said bread material in said article being in the form of a substantially flat planar structure of wafer-thin thickness extending outwardly from said capsule, said bread material of said flat wafer-thin planar structure occupying more than 75 percent of the total area of a two-dimensional plane struck through said article at a location within and bisecting said flat wafer-thin planar structure, said capsule being at a location intersected by said two-dimensional plane, at least a portion of said bread material of said article extending out of said flat wafer-thin planar structure and snugly overlapping said capsule on opposite sides thereof as viewed from opposite sides of said two-dimensional plane, such that said capsule is locked in position in said article, at least a portion of said capsule being exposed to direct view and not covered by any said bread material, the thickness of said article being greatest at the location of said capsule, all other portions of said article being of wafer-thin thickness not exceeding two millimeters.

4,163,066

FREE-FLOWING, NON-CHARRING SOLID FAT USEFUL FOR POPPING POPCORN

Ron G. Mason, Arlington, and Herbert L. Rice, Fort Worth, both of Tex., assignors to Richard D. Emerick, Fort Worth, Tex.

Filed Nov. 10, 1977, Ser. No. 850,447
Int. Cl.[2] A23D *5/00*; A23L *1/18*
U.S. Cl. 426—99 **10 Claims**

7. A method of popping popcorn in popping equipment comprising the steps of:

a. hydrogenating an edible vegetable oil consisting essentially of edible triglycerides containing predominately 16–18 carbon atoms, inclusive, to have a melting point above 122° F.;

b. melting said hydrogenated edible vegetable oil;

c. while said hydrogenated edible vegetable oil is molten, homogeneously admixing a water soluble, edible, inorganic salt of particle sizes small enough to remain in substantially homogeneous admixture during solidification of said mixture of hydrogenated vegetable oil and salt; said particle sizes being at least as small as −100 mesh; said hydrogenated edible vegetable oil and salt being admixed in respective concentrations within the respective ranges of 50–95 and 5–50 percents by weight;

d. solidifying said substantially homogeneous admixture of said hydrogenated edible vegetable oil and said salt;

e. subdividing said solidified hydrogenated vegetable oil and

salt into free flowing solid particles of a mean particle size of about 0.2 inches but less than 1 inch;

f. admixing a first quantity of said free flowing solid particles of said hydrogenated edible vegetable oil and said salt with a second quantity of the popcorn; said first and second quantities of said free flowing particles of said hydrogenated edible vegetable oil and salt and said popcorn being within respective proportions of 10–30 and 70–90 percents by weight; and

g. popping said popcorn with said fat and salt with essentially no tar and char build-up, practically no smoke and fumes, and no excessive oil accumulation.

4,163,067

GLYCYRRHIZIN-FREE FRACTIONS FROM LICORICE ROOT AND PROCESS FOR OBTAINING SUCH FRACTIONS

Harold A. Hartung, West Collingswood, N.J., assignor to MacAndrews and Forbes Company, Camden, N.J.

Continuation-in-part of Ser. No. 695,537, Jun. 14, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,896

Int. Cl.² A23L *1/22*

U.S. Cl. 426—573 **13 Claims**

1. A process for recovery of deglycyrrhizinated fractions from water insoluble licorice root residue remaining after extraction of fresh licorice root with an unbuffered aqueous extractant having a ph of from about 3 to about 12 to obtain primary root extracts having pH values between about 5 and about 6 which comprises:

(a) treating the water insoluble residue with an aqueous alkaline extractant producing an aqueous alkaline extract having a pH less than 10 and an insoluble residue;

(b) separating and isolating said aqueous alkaline extract and said insoluble residue;

(c) treating the aqueous alkaline extract with sufficient acid to acidify the extract to a pH of from about 2 to about 6, forming an acid soluble fraction and an acid insoluble residue;

(d) separating and isolating said acid soluble fraction and said acid insoluble residue;

(e) treating the acid insoluble residue with sufficient alkali to solubilize and alkalify the residue to a pH of from about 8 to less than 10 forming an alkali soluble fraction; and

recovering said acid soluble fraction and said alkali soluble fraction, said fractions being essentially glycyrrhizin-free, lacking the flavor characteristic of licorice.

4,163,068

FLAVORING WITH TERPENYL ETHERS

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687. This application Sep. 5, 1978, Ser. No. 939,897

Int. Cl.² A23L *1/226*

U.S. Cl. 426—538 **6 Claims**

1. A method for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.5 parts per million up to about 100 parts per million of a C_{10}-terpenyl ether selected from the group consisting of:

1,8-Dimethoxy-p-menthane; and

1,8-Diethoxy-p-menthane

4,163,069

NON-FAT DRY MILK SUBSTITUTE PRODUCT

Nicholas Melachouris, White Plains; Brenda B. Fracaroli, Ossining, and Constance R. Corbett, White Plains, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 11, 1977, Ser. No. 840,684

Int. Cl.² A23C *21/00*

U.S. Cl. 426—582 **45 Claims**

1. A non-fat dry milk substitute product comprising lactalbumin, sodium hexametaphosphate and a modified whey solids product derived from a process of adding a divalent metal ion to a raw whey feed and adjusting the pH to a value above about 6 at a temperature below about 140° F. (60° C.) thereby causing precipitation of the modified whey solids product;

wherein the protein content of the non-fat dry milk substitute product is from about 17% to about 30%, (by weight, dry basis);

wherein the weight ratio (dry basis) of modified whey solids to lactalbumin is from about 2:1 to about 5:1; and

wherein the weight ratio (dry basis) of sodium hexametaphosphate to lactalbumin is from about 0.05:1 to about 0.20:1.

4,163,070

SHROUDING SKINNED MEAT CARCASSES

Beverly E. Williams, P.O. Box 299, San Mateo, Calif. 94401, assignor to B. E. Williams and K. I. Williams, both of San Mateo, Calif.

Filed May 4, 1977, Ser. No. 793,744

Int. Cl.² A23B *4/00*

U.S. Cl. 426—642 **3 Claims**

1. A method of treating freshly slaughtered and skinned meat carcasses to smooth the fat surface, increase the whiteness of the outer fat surface and reduce carcass weight shrinkage comprising the steps of applying to each carcass a shroud consisting of a rectangular cloth consisting essentially of yarns, said cloth being thoroughly wetted with an aqueous saline solution, the yarns in said cloth consisting of a blend of cotton and polyester fibers, the density of the yarns in the cloth being less than 36 per inch in the longitudinal direction and less than 36 per inch in the transverse direction to provide interstices for capillary attraction and ventilation of the carcass surface and the accommodation of skewers without substantial fracturing of the yarns, said interstices retaining said aqueous solution when the shroud is wetted, said cloth being applied with skewers to tension the shroud on the carcass to insure that the interstices remain open to retain the solution entrained when the fabric is wet; maintaining said shrouded carcass in a cooling room to thereby cool the shrouded carcass to the cooling room temperature over a period of time sufficient to cause the shroud to lose the free surface moisture thereof and thereafter peeling the shroud from the carcass.

4,163,071

METHOD FOR FORMING HARD WEAR-RESISTANT COATINGS

Merle H. Weatherly, Indianapolis, and Robert C. Tucker, Jr., Brownsburg, both of Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,704

Int. Cl.² B05D *3/06*

U.S. Cl. 427—34 **5 Claims**

1. A method for forming a hard wear-resistant coating on an engine valve made of nitrogen strengthened iron-base alloy which comprises preheating the engine valve to a temperature of from 650° C. to 1000° C., depositing with a plasma or D-gun process a composition consisting essentially of 28 Cr-1.1 C-1.0 Si-4.0 W-3.0 Fe-3.0 Ni-Bal Co, all in wt.% whereby a fine uniform dispersion of carbide particles is found throughout the coating to provide said hard wear-resistant coating.

2. A method for forming hard wear-resistant coatings on metallic substrates which comprises

(a) preheating the substrate to a temperature in the range of from 350° to 1000° C.,

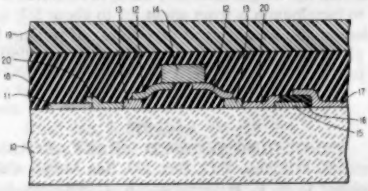
(b) depositing with plasma or D-gun process a composition consisting essentially of 28 Cr-1.1 C-1.0 Si-4.0 W-3.0 Fe-3.0 Ni-Bal Co, all in wt.%, while maintaining such substrates with said temperature range; whereby a fine uniform dispersion of carbide particles is formed throughout the coating to provide said hard wear-resistant coatings.

4,163,072

ENCAPSULATION OF CIRCUITS

Nicholas A. Soos, Macungie, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 7, 1977, Ser. No. 804,439
Int. Cl.² H01L *23/30*; B05D *1/38*
U.S. Cl. 427—96 **13 Claims**



1. A method of encapsulating circuit components comprising the steps of:

applying over said components a first layer comprising a room temprature vulcanizing silicone rubber which cures by reaction with moisture;

while said first layer is in a substantially uncured state, applying over said first layer a second layer comprising a polymer selected from the group consisting of polyurethane and epoxy; and

exposing the resulting structure to moisture at a temperature and for a time sufficient to cure both of said layers so that the two layers adhere strongly to one another.

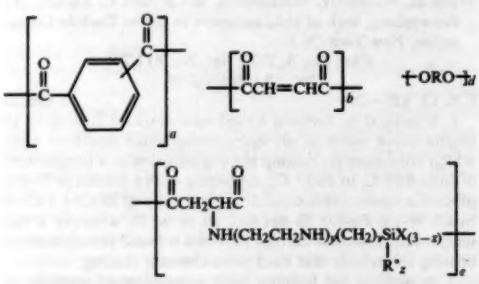
4,163,073

PROCESS FOR TREATING INORGANIC SILICEOUS SURFACES

Enrico J. Pepe, and James G. Marsden, both of Amawalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 813,074, Jul. 5, 1977, Pat. No. 4,122,074.
This application Jul. 17, 1978, Ser. No. 925,202
Int. Cl.² B05D *7/00*
U.S. Cl. 427—221 **12 Claims**

1. A process for rendering inorganic siliceous material compatible with and adherent to organic resins comprising coating the surfaces of said inorganic siliceous material, prior to or at the time of combination with said organic resin, with a polymer having a molecular weight of greater than 1000 comprising units of the formula



wherein R is a divalent hydrocarbon radical; R* is a monovalent alkyl, aryl or aralkyl group; X is a monovalent alkoxy, hydroxy or oxy- group; y is 0 or 1; v is an integer of 1 to 6; z is 0, 1 or 2; a is a mole fraction of 0 or 0.004 to 0.6; and b, d and e are mole fractions ranging from about 0.004 to about 0.6 with the proviso that d is greater than, equal to or slightly less than the sum of a, b and e.

4,163,074

METHOD FOR FAST ADHESION OF SILVER TO NITRIDE TYPE CERAMICS

Yoshihiro Ebata, Kawanishi; Yasuo Toibana, Ikeda; Tsuneo Uetsuki, Kawanishi; Saburo Kose, and Makoto Kinoshita, both of Ikeda, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,372
Claims priority, application Japan, Apr. 20, 1977, 52-46221
Int. Cl.² C04B *41/38*
U.S. Cl. 427—229 **6 Claims**

1. A method for fast adhesion of silver to a nitride type ceramic article, which comprises:

coating the surface of the nitride type ceramic article with a mixture consisting of copper sulfide and kaolin, the mixing ratio of copper sulfide and kaolin being 99 to 80% by weight of the former to 1 to 20% by weight of the latter,

heating the ceramic article coated with the mixture in a nitrogen-containing atmosphere at a temperature in the range of from 900° to 1300° C.,

overcoating the thermally treated ceramic article with silver carbonate, and

heating the ceramic article overcoated with silver carbonate in a nitrogen-containing atmosphere at a temperature in the range of from 700° to 940° C.

4,163,075

ELECTRIC DISCHARGE RECORDING MATERIAL

Shiro Nakano, Suita, and Masaru Koike, Mishima, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1977, Ser. No. 813,776
Claims priority, application Japan, Jul. 8, 1976, 51-81513; Jul. 8, 1976, 51-81514; Jan. 12, 1977, 52-2658; Mar. 9, 1977, 52-26361
Int. Cl.² G32B *5/16*; G01D *15/06*
U.S. Cl. 428—328 **19 Claims**

1. A composite discharge recording material which comprises

(a) an electric discharge-breakable semiconductive resin layer having a surface resistance of 10^5 to 10^{16} ohms and a volume resistance of 10^3 to 10^{14} ohms-cm, said resin layer being formed by dispersing a conductivity-imparting agent in a resin matrix;

(b) a metal-containing resin layer having a surface resistance of at least 10^8 ohms and a volume resistance of not more than 10^4 ohms-cm laminated on one surface of the semiconductive resin layer (a), said resin layer being prepared by dispersing an electrically conductive and stable metal powder having a specific resistance of not more than 2×10^{-4} ohm-cm and a particle diameter of from 0.2 to 20 microns in a resin matrix which is a film-forming, electrically insulative thermoplastic or thermosetting resin; and

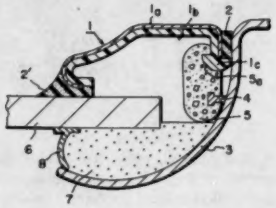
(c) a conductive layer laminated on the other surface of the semiconductive resin layer (a) and having a surface resistance of not more than 10^4 ohms and a volume resistance of not more than 10^2 ohms-cm, said conductive layer comprising a thermoplastic or thermosetting resin having a conductivity-imparting agent dispersed therein, or a vacuum-deposited metal layer or a metal foil layer.

4,163,076

SYNTHETIC RESIN WINDOW MOLDING

Hisanori Katoh, Tokyo, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 5, 1977, Ser. No. 839,752
Int. Cl.[2] B32B *15/08*
U.S. Cl. 428—339 6 Claims



1. A window molding comprising:

(a) a layer of synthetic resin having first and second end portions at the opposite ends thereof, said resin layer with said first and second end portions forming an approximate C-shape, wherein the first end portion is an anchor and the second end portion is bent at an angle with respect to the remainder of said resin layer;

(b) a stainless foil adhered to one surface of said resin layer wherein said first and second end portions of said one surface extend beyond the ends of said stainless foil; and

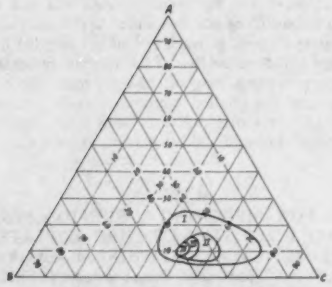
(c) first and second protective layers of soft plastic material, said first protective layer being adhered to one end portion of said stainless foil and said first end portion of said resin layer and said second protective layer being adhered to the other end portion of said stainless foil and said second end portion of resin layer.

4,163,077

CONTAMINATION-TOLERANT PRESSURE-SENSITIVE ADHESIVE TAPE

Stephen A. Antonsen, Vancouver, Canada, and David P. Boaz, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1978, Ser. No. 897,851
Int. Cl.[2] C09J *7/02*
U.S. Cl. 428—355 11 Claims



1. Pressure-sensitive tape comprising a sheet backing coated with a layer of normally tacky and pressure-sensitive adhesive which is not only capable of maintaining useful bonding properties even after its surface has been contaminated with talc but which also has good shear adhesion, a force of at least 15 grams per centimeter width being required to remove said pressure-sensitive tape from a talc-contaminated polyethylene film, said adhesive consisting essentially of a blend of 100 parts by weight of

(a) 5–25 parts by weight of a rubbery synthetic block copolymer selected from the class consisting of:

(1) A-B, A-B-A or blends of A-B and A-B-A wherein A is a polymer of styrene and B is selected from the class consisting of homopolymers of isoprene and copolymers of ethylene and butylene and

(2) radial or teleblock copolymer consisting of several polystyrene-terminated elastomeric branches, each of said branches being a homopolymer of isoprene extending from a central hub;

(b) 15–50 parts by weight of polyterpene-type tackifier resin which is solid at room temperature; and

(c) 40–75 parts by weight of a polyterpene-type tackifier resin which is liquid at room temperature.

4,163,078

HYDROPHILIC BI-COMPONENT THREADS

Ulrich Reinehr, Dormagen; Christian Pieper, Neuss, and Peter Kleinschmidt, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,229
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625908
Int. Cl.[2] D01D *5/06;* D01F *8/04, 8/08;* D07G *3/04*
U.S. Cl. 428—373 6 Claims

1. A bicomponent filament or fiber of two different fiber-forming synthetic polymers in which the two components are eccentric to each other and in which at least one component has a core/sheath structure with a microporous core, and a sheath denser than the core; and in which the bicomponent filament or fiber has a moisture absorption of at least 1.5 at 65% relative atmospheric humidity and 21° C., a moisture absorption of at least 5% at 90% relative atmospheric humidity and 21° C.; and a water-retention power of at least 10%.

4,163,079

METHOD FOR FACILITATING TRANSPORTATION OF PARTICULATE ON A CONVEYOR BELT IN A COLD ENVIRONMENT

Frank J. Beafore, Greensburg, Pa., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,500
Int. Cl.[2] B32B *9/04;* C09K *3/18*
U.S. Cl. 428—411 14 Claims

1. A method for facilitating transportation of particulate solids on a conveyor belt, at least a portion of which is exposed to a temperature of less than 0° C., comprising:

(a) contacting the surface of said belt upon which the particulate solids are transported with from about 0.001 to about 0.005 gallons per square foot of belt surface, of a composition consisting substantially of water soluble components comprising

(A) a water soluble polyhydroxy compund or monoalkyl ether thereof, and

(B) a water soluble organic nonvolatile compound having at least one hydrophilic group, said compound (B) being different from said compound (A), said composition being substantially free of corrosion inducing metal halide salts;

(b) placing particulate solids on the treated belt;

(c) moving the belt so that said solids are transported; and
(d) exposing at least a portion of the treated belt surface to a temperature of less than 0° C.

4,163,080

FLEXIBLE DOUBLE-LAYER POLYPROPYLENE LAMINATES FOR THE PACKAGING OF FOOD PRODUCTS

Pierpaolo Buzio, Rho, and Lucio Edefonti, Busto Arsizio, both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Apr. 13, 1978, Ser. No. 895,822
Claims priority, application Italy, Apr. 13, 1977, 22393-A/77
Int. Cl.[2] B32B *27/40*
U.S. Cl. 428—424 **7 Claims**

1. A flexible double-layer polypropylene laminate consisting essentially of a biaxially oriented film consisting essentially of isotactic polypropylene with an atactic polypropylene content of less than 6% by weight and an intrinsic viscosity, measured in decalin at 135° C. with an UBBELOHDE viscometer (standard ASTM D 1601), of from 1.5 to 3.0 dl/g, adhesively bonded with a non-oriented film consisting essentially of a mixture of isotactic polypropylene and atactic polypropylene, the latter in an amount of from 15 to 30% by weight of the total weight of the said mixture, the said isotactic polypropylene of said mixture having an intrinsic viscosity (standard ASTM D 1601) of from 1.0 to 1.5 dl/g and the said atactic polypropylene of said mixture having a density (standard ASTM D 1505) of from 0.855 to 0.865 g/cm^3 and a viscosity when fused at 160° C., determined with a rotational viscometer, of from 3,000 to 10,000 cps.

4. A process for producing a flexible double-layer plastic laminate, which comprises preparing a biaxially oriented film consisting essentially of isotactic polypropylene with an atactic polypropylene content of less than 6% by weight and an intrinsic viscosity of from 1.5 to 3.0 dl/g, as measured at 135° C. in decalin with an UBBELHODE viscometer (standard ASTM D 1601), and a non-oriented film consisting essentially of a mixture of isotactic polypropylene and atactic polypropylene, the latter being present in the mixture in an amount of from 15 to 30% by weight, said isotactic polypropylene of said mixture having an intrinsic viscosity (standard ASTM D 1601) of from 1.0 to 1.5 dl/g and said atactic polypropylene of said mixture having a density (standard ASTM D 1505) of from 0.855 to 0.865 g/cm^3 and a viscosity when fused at 160° C., determined with a rotational viscometer, of from 3,000 to 10,000 cps, applying on to at least one of the surfaces to be bonded of said films an adhesive in an amount of from 1.5 to 3 g per m^2 of surface, and laminating the said films at a temperature of from 60° to 80° C.

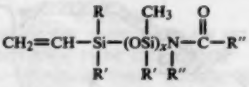
4,163,081

SELF-ADHERING SILICONE COMPOSITIONS AND PREPARATIONS THEREOF

Jay R. Schulz, Bangor Township, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 8, 1978, Ser. No. 904,175
Int. Cl.[2] C08L *83/04*
U.S. Cl. 428—429 **27 Claims**

1. A composition comprising a product obtained by mixing
(A) a vinyl-containing polydiorganosiloxane having an average of about two silicon-bonded vinyl radicals per molecule, an average ratio of organo radicals per silicon atom within a range of greater than 2 up to and including 2.03 and each organo radical of the polydiorganosiloxane being a monovalent radical selected from the group consisting of hydrocarbon radicals and fluorinated alkyl radicals both having less than 7 carbon atoms per radical,
(B) an organosilicon compound having an average of at least 3 silicon-bonded hydrogen atoms per organosilicon compound molecule and valences of any silicon atom in the organosilicon compound not satisified by a hydrogen bond are satisfied by a divalent oxygen atom or an organo radical wherein each organo radical is a monovalent radical selected from the group consisting of hydrocarbon radicals and fluorinated alkyl radicals both having less than 7 carbon atoms per radical, the organo-silicon compound having no more than one silicon-bonded hydrogen atom on any one silicone atom,
(C) a platinum catalyst, and
(D) an amidosiloxane of the formula



where R is a methyl, ethyl, or phenyl radical; R′ is a methyl, ethyl, or 2-(perfluoroalkyl)ethyl radical in which the perfluoroalkyl radical contains 1 to 4 inclusive carbon atoms; R″ is a methyl or ethyl radical; and x is an integer of from 3 to 20,
(A) and (B) being present in amount sufficient to provide a mole ratio of silicon-bonded hydrogen atoms in (B) to silicon-bonded vinyl radical in (A) in the range of 0.5 to 10, (D) being present in amounts of 0.01 to 2.5 parts by weight per 100 parts by weight of the composition.

4,163,082

U.V.-RADIATION METHOD FOR DECREASING SURFACE TACK OF DISPOSED ORGANOPOLYSILOXANE GREASES AND GELS

David J. Romenesko, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 23, 1978, Ser. No. 953,515
Int. Cl.[2] C08F *30/08*; C08L *43/04*
U.S. Cl. 428—447 **8 Claims**

1. A process for reducing the surface tack of an organopolysiloxane gel or grease, adheringly disposed on a substrate, said process comprising
(I) applying to the surface of said disposed gel or grease a continuous layer of a liquid organopolysiloxane-composition which is convertible by ultraviolet radiation to the solid state and which consists essentially of a mixture of
(a) an organopolysiloxane wherein an average of at least two of the organic radicals per molecule are silicon-bonded olefinic radicals selected from the group consisting of vinyl and butenylene and
(b) a hydrogen-containing organopolysiloxane, free of aliphatic unsaturation, wherein the average molecule contains at least two hydrogen radicals selected from the group consisting of silicon-bonded hydrogen and mercaptoalkyl hydrogen, at least one of (a) and (b) having an average of more than two of said olefinic radicals and said hydrogen radicals, respectively, per molecule, and
(II) exposing the applied continuous layer of convertible liquid to ultraviolet radiation until it is converted to a continuous layer of solid organopolysiloxane.

4,163,083

PROCESS FOR IMPROVING CORROSION RESISTANT CHARACTERISTICS OF CHROME PLATED ALUMINUM AND ALUMINUM ALLOYS

Michael J. Pryor, Woodbridge, Conn., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 816,315, Jul. 18, 1977, Pat. No. 4,111,763.
This application Apr. 11, 1978, Ser. No. 895,412
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.[2] B32B *15/20, 3/00, 15/04*; C25D *11/04*
U.S. Cl. 428—472 **3 Claims**

1. A coated article which is readily plated by standard plating techniques and characterized by high corrosion resistance to the acid nature of the plating bath comprising an aluminum substrate, a microporous anodic oxidized crystalline surface on

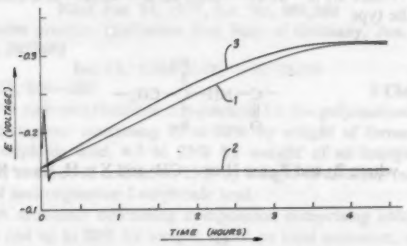
said substrate including in part comparatively large pores substantially normal to said substrate, and an electronically conductive oxide of high ionic resistance continuously distributed in said microporous anodic oxidized crystalline surface and said large pores so as to form a continuous high corrosion resistant barrier layer.

4,163,084

ELECTROCHEMICALLY STABLE CATHODE

Keh-Chi Tsai, Saratoga, and Ernest L. Littauer, Los Altos Hills, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 27, 1978, Ser. No. 928,544
Int. Cl.[2] H01M 6/04
U.S. Cl. 429—206 5 Claims



1. An electrochemical cell consisting essentially of an anode, a cathode having an essentially continuous layer of ruthenium on its surface and an aqueous alkaline salt electrolyte in which said anode and cathode are immersed, said electrolyte containing a reducible species selected from the group consisting of peroxyl ions, chlorine and oxygen which is electrochemically reduced at said cathode.

4,163,085

PROCESS FOR THE PRODUCTION OF POLYOLEFIN FOAM SHEETS CONTAINING PORE REGULATORS

Werner Kühnel, Neunkirchen, and Paul Spielau, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,604
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543248
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—96 24 Claims

1. A process for the production of a continuous foam sheet by thermal crosslinking and foaming of a synthetic resin of a polyolefin shaped into a sheet or panel and containing an organic peroxide, and a blowing agent, which comprises adding to and finely distributing in the synthetic resin of a polyolefin and containing an organic peroxide and a blowing agent at below the decomposition temperature of the peroxide and of the blowing agent in the thermoplastic range, at least one pore regulator selected from the group consisting of oligomeric and polymeric saturated dicarboxylic acid esters and dicarboxylic acid ester mixtures having a flow point or melting range below the decomposition temperature of the peroxide and of the blowing agent, said dicarboxylic acid esters or dicarboxylic acid ester mixtures containing, as the diol component, residues of one or more saturated diols of the formula —O—R′—O—, wherein R′ represents an alkylene residue of 2–8 carbon atoms in the chain or an alkylene residue of 2–8 carbon atoms in the chain having one or more cycloalkyl groups or one or more alkyl groups of 1–3 carbon atoms.

4,163,086

NOVEL OXYALKYLATED POLYOL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 745,049, Nov. 26, 1976, Pat. No. 4,108,808. This application Mar. 31, 1978, Ser. No. 892,271
Int. Cl.[2] G08G 18/00
U.S. Cl. 521—155 34 Claims

25. A process for preparing a cellular polyurethane interpolymer comprising interpolymerizing an organic polyisocyanate with at least one oxyalkylated polyol in the presence of a foaming agent, the said polyol being a reactive liquid polyol prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1–8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol and being oxyalkylated with about 1–10 moles of an alkylene oxide containing about 2–4 carbon atoms, the said prepolymer having a viscosity of about 1000–500,000 centipoises at 25° C. and containing about 1.1–6 moles of interpolymerized aldehyde and about 3.1–15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith.

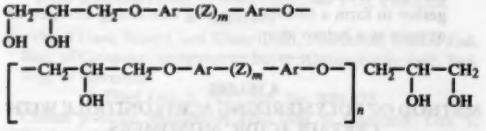
4,163,087

METHOD FOR PRODUCTION OF NEW THERMAL AND CHEMICAL RESISTANT POLYURETHANE PLASTICS

Zbigniew Brzozowski; Jedrzej Kielkiewicz; Gabriel Rokicki; Andrzej Kaminski; Danuta Chomicz, and Boguskaw Goraj, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation of Ser. No. 611,840, Sep. 9, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 843,703
Claims priority, application Poland, Sep. 12, 1974, 174046; Jun. 23, 1975, 181469; Jun. 23, 1975, 181474
Int. Cl.[2] C08G 18/14, 18/48, 18/32
U.S. Cl. 521—176 9 Claims

1. A method for production of thermal and chemical resistant polyurethane plastics, in the form of forms, these foams being obtained from reaction of di- or poly-isocyanates with polyols, wherein the polyols have the formula 1:



in which Ar is either a substituted or unsubstituted benzene, naphthalene, or anthracene ring, said substituents being one or more alkyl, aryl or allyl radicals or halogen atoms; Z is the oxygen atom, an SO_2 group or a divalent radical, —CRR_1—, where R and R_1 may be identical or different and are either a hydrogen atom or an alkyl radical; m is 0 or 1; and n is 0 or an integer 1–10, or their mixtures with other low-viscosity polyols, said mixtures being reacted with di- or poly-isocyanates in the presence of catalysts, foaming agents and solvents.

4,163,088

ANTISTATIC POLYAMIDE COMPOSITIONS WITH POLYALKYLENEGLYCOL ETHER HAVING SECONDARY TERMINAL URETHANE GROUPS

Hans E. Künzel, Dormagen; Claus-Rüdiger Bernert, Bomlitz; Günter Arend, Dormagen; Francis Bentz, Cologne; Helmut Sinner, and Dieter Brokmeier, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

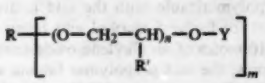
Continuation of Ser. No. 554,516, Mar. 3, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,051

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1974, 2409715

Int. Cl.[2] C08L *77/02;* **C08G** *69/46*

U.S. Cl. 525—433 **8 Claims**

1. An antistatic polyamide composition consisting essentially of a polycarbonamide and, as an antistatic agent, from 0.5 to 20% by weight, based on said polycarbonamide, of a polyalkylene glycol ether with secondary terminal urethane groups corresponding to the general formula:



in which

m is a number of from 1 to 6;

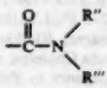
n is a number of from 3 to 60;

R is an m-functional radical selected from the group consisting of alkyl, cycloalkyl, alkenyl, aralkyl, aryl, alkaryl, or any of alkyl, cycloalkyl, and alkenyl containing oxygen or nitrogen as a hetero atom;

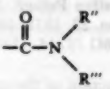
R additionally is Y when m=1;

R' is hydrogen, C_1-C_5-alkyl, cycloalkyl, aryl, alkaryl, or aralkyl;

Y is hydrogen or



provided that at least 70% of the Y radicals are



;

R'' and R''', independently of each other, are C_1-C_{30}-alkyl, cycloalkyl, aryl, aralkyl, alkaryl;

R'' and R''' additionally are C_1-C_{30}-alkyl interrupted by nitrogen or oxygen as a hetero atom, or are joined together to form a heterocyclic ring containing nitrogen or oxygen as a hetero atom.

4,163,089

METHOD OF POLYMERIZING ACRYLONITRILE WITH CERTAIN ACIDIC MONOMERS

George Palethorpe, Durham, N.C., assignor to Monsanto Company, Decatur, Ala.

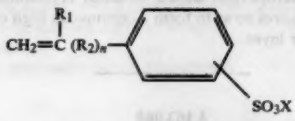
Filed May 14, 1975, Ser. No. 577,521

Int. Cl.[2] C08F *220/46*

U.S. Cl. 526—80 **4 Claims**

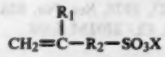
1. In a method of continuously polymerizing in the presence of an effective initiator/catalyst system 35 to 85 weight percent, based on total monomer weight, of acrylonitrile with 10 to 65 weight percent of at least one non-acidic monoolefinic monomer copolymerizable with acrylonitrile and 0.5 to 5 weight percent of an acidic monomer selected from the group consisting of

a.

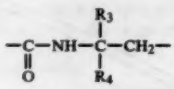


where R_1 is —H or —CH_3, R_2 is —CH_2O—, —O—, or —CH_2—, n is 0 or 1 and X is Na, K or H,

b.

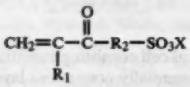


where R_1 is —H or —CH_3, R_2 is —CH_2— or a structure of the type



where R_3 and R_4 are H or —CH_3 and X is H, Na or K, and

c.



where R_1 is H or —CH_3 and R_2 is —CH_2— or —CH_2CH_2— and X is H, Na or K wherein the acrylonitrile and the nonacidic mono-olefinic monomer are continuously charged to a reaction vessel having a predetermined dwell time, the improvement comprising feeding to the reaction vessel at least 65 percent of said acidic monomer percent in a first time period and then feeding the remainder of said acidic monomer in a second time period, said first and second periods making up a cycle, said first time period being 5 to 25 percent of the second time period and the length of the cycle being 15 to 25 percent of said dwell time.

4,163,090

PROCESS FOR PREPARING NORMALLY CRYSTALLINE VINYLIDENE HALIDE POLYMERS HAVING SUPERIOR FLOW PROPERTIES EMPLOYING A COMBINATION OF COLLOIDAL SILICA AND NON-IONIC WATER SOLUBLE CELLULOSE ETHER HAVING A VISCOSITY OF ABOUT 5 CP OR LESS AS STABILIZING AGENTS

Ralph M. Wiley; Merritt R. Meeks, both of Midland, and Burke A. Beebe, Gladwin, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 27, 1977, Ser. No. 836,935

Int. Cl.[2] C08F *2/20, 4/34, 14/08*

U.S. Cl. 526—88 **7 Claims**

1. In a process of making solid bodies of normally crystalline vinylidene halide polymers in the form of spheroidal globules comprising the steps of forming a mixture of a polymerizable liquid and an aqueous non-solvent liquid medium, the non-solvent liquid medium containing a water-dispersible, water-insoluble, colloidal solid particle emulsifier; mechanically agitating the mixture to disperse the polymerizable liquid as smaller-than-stable droplets in the non-solvent liquid medium; bringing the resulting unstable dispersion to a condition of quiescence, whereby the unstable droplets undergo a limited coalescence to form a stable suspension of droplets; treating

the stable suspension with a stabilizing agent to prevent agglomeration of the droplets; and thereafter subjecting the suspension to polymerization conditions without high turbulence;

the improvement which comprises employing in combination colloidal silica as the solid particle emulsifier, and a low molecular weight, non-ionic, water-soluble cellulose ether, having a viscosity grade of about 5 centipoise or less, as the stabilizing agent.

4,163,091

PROCESS FOR THE POLYMERIZATION OF CHLOROPRENE

Hans-Jürgen Pettelkau, Burscheid, and Gerhard Hohmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,360

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627452

Int. Cl.[2] C08F *2/00, 4/30, 36/18*

U.S. Cl. 526—208 **5 Claims**

1. An activator/initiator composition for the polymerization of chloroprene containing 95 to 50% by weight of formamidine sulphinic acid, 4.5 to 25% by weight of an inorganic peroxy compound and 0.5 to 25% by weight of an alkali metal salt of anthraquinone-2-sulphonic acid.

3. A monomer containing composition comprising chloroprene and up to 50% by weight, based on total monomer, of a monomer which is copolymerizable with chloroprene and from 0.02 to 0.6% by weight, based on total monomer, of the activator/initiator composition of claim 1.

4,163,092

CATIONIC HYDROGELS BASED ON HYDROXYALKYL ACRYLATES AND METHACRYLATES

Robert Steckler, Crofton, Md., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

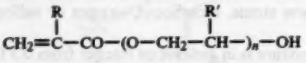
Division of Ser. No. 549,096, Feb. 11, 1975, Pat. No. 4,060,678. This application Aug. 18, 1977, Ser. No. 825,521

Int. Cl.[2] C08F *220/06*

U.S. Cl. 526—292 **6 Claims**

1. The cationic, polymeric hydrogel produced by the process which comprises simultaneously polymerizing and crosslinking, in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers, and at a temperature of from about 20° C. to about 125° C., a mixture consisting essentially of the following monomers:

(a) about 40 to about 95 weight percent, based on the total weight of monomers of an acrylic monomer selected from the group consisting of glyceryl monoacrylates and monomethacrylates and acrylic monomers having the formula:

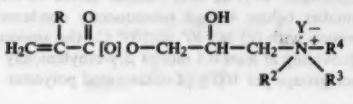


wherein:

R and R′ each represents hydrogen or lower alkyl of 1 to about 6 carbon atoms;

n represents and integer of from 1 to about 50;

(b) about 50 to about 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated cationic monomer, capable of copolymerizing with (a), and which is a quaternary ammonium compound having the formula:



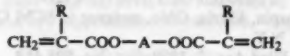
wherein:

R represents H or CH_3;

R^2, R^3 and R^4, each of which may be the same or different, each represents alkyl, phenyl or aralkyl; and

Y represents an anion forming the anionic portion of a quaternary ammonium group;

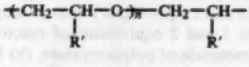
(c) about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent capable of copolymerizing with (a) and (b): and having the formula:



wherein

R represents a member of the group consisting of hydrogen and alkyl of from 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbons or a polyglycol ether group of the formula:



in which

R′ represents a member of the group consisting of hydrogen and alkyl of 1 to 2 carbon atoms; and

n represents an integer of from 1 to about 20; and

(d) from 0 to about 50 weight percent, based on the total weight of monomers, of other monoethylenically unsaturated monomers capable of copolymerizing with (a), (b) and (c) and selected from the group consisting of: acrylamides, methacrylamides, alkyl acrylates, alkyl methacrylates, N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole;

Provided that (a)≧(d) and (a)+(d)=about 40 to about 95 weight percent; and when an N-vinyl lactam, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone or N-vinyl imidazole is used it is present in an amount of less than 20 weight percent.

4,163,093

PROCESS FOR THE PRODUCTION OF POLYESTERS FOR AIR-DRYING UNSATURATED POLYESTER RESINS

Bernhard Hess, Moers, and Klaus Kraft, Muelheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,575

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645657

Int. Cl.[2] C08L *67/06*

U.S. Cl. 528—301 **2 Claims**

1. A process for producing an unsaturated polyester comprising the condensation product of (a) an α,β-ethylenically unsaturated dicarboxylic acid or an anhydride thereof, (b) a dihydric alcohol which is free from β,γ-ethylenically unsaturated ether groups and (c) an alcohol having at least one β,γ-ethylenically unsaturated ether group, said process comprising the steps of initially condensing a mixture consisting of (a) and (b) in the absence of oxygen at 140° to 220° C. to form a polyes-

ter precondensate with an acid number above 70 and a hydroxyl number below 40 and subsequently condensing said precondensate with (c) at 140° to 200° C., the amount of (c) utilized providing at least 0.1 mol of β,γ-ethylenically unsaturated ether groups per 100 g of unsaturated polyester.

4,163,094

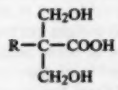
HEAT CURING WATER SOLUBLE HOMOPOLYURETHANES

Edward T. Turpin, Elyria, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Apr. 7, 1978, Ser. No. 894,489
Int. Cl.² C08G *18/80*
U.S. Cl. 528—45 **2 Claims**

1. In a process for manufacturing a water soluble homopolymer polyurethane being self-curing upon application of heat, comprising the steps of:

copolymerizing on a weight basis (a) 16% to 87% of a partially blocked polyisocyanate containing on an average between 0.05 and 2 equivalents blocked isocyanate groups and between 1 and 2 equivalents of reactive isocyanate groups per molecule of polyisocyanate, (b) 5% to 84% of a low molecular weight dihydroxy-acid containing at least one non-reactive group and at least two reactive hydroxyls and of the general structure



wherein R is a hydrogen, a hydroxymethyl, or an alkyl having up to 20 carbon atoms, and the hydroxyl groups being reactive to copolymerize with the reactive isocyanate groups on said polyisocyanate to provide repeating urethane linkages, and (c) 0% to 69% of a polyol selected from diols and triols, having a molecular weight less than 500, said polyols having at least two reactive hydroxyls for copolymerizing with the reactive isocyanate groups on said polyisocyanate to provide repeating urethane linkages, said dihydroxy-acid (b) and said polyol (c) collectively containing at least about 2.5% excess equivalents of reactive hydroxyls relative equivalents of reactive isocyanate groups on said polyisocyanate (a) to completely react available reactive isocyanate groups into urethane linkages, said polyisocyanate (a) and said dihydroxy-acid (b) and said polyol (c) being copolymerized at temperatures between about 50° C. and 100° C. to form a homopolymer polyurethane containing repeating urethane linkages and having blocked isocyanate groups, unreacted hydroxyl groups and unreacted carboxyl groups;

neutralizing the unreacted carboxyl groups on said homopolymer polyurethane with a base and solubilizing said homopolymer polyurethane in water to provide a stabilized aqueous polyurethane mixture;

coating a substrate with a film of said aqueous polyurethane mixture; and

heating the film at temperatures above about 150° C. for time sufficient to heat cure the film by cross-linking the blocked isocyanate groups with the unreacted hydroxyl groups of said homopolymer polyurethane.

4,163,095

PROCESS FOR THE SOLVENT-FREE PRODUCTION OF SOLID PLASTIC MOLDINGS, SEALING COMPOUNDS AND INSULATIONS USING A POLYISOCYANATE MIXTURE CONTAINING 2,4'-DIISOCYANATODIPHENYLMETHANE

Rolf Kübens, Odenthal; Fritz Ehrhard, Neuss, and Herbert Gebauer, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,175
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623401
Int. Cl.² C08G *18/76*
U.S. Cl. 528—67 **3 Claims**

1. In a process for the solvent-free production of solid plastic moldings, sealing compounds and insulations based on polyurethane by reacting a reaction mixture of polyisocyanates and polyhydroxyl compounds, optionally in the presence of auxiliary agents and additives used in polyurethane chemistry, the improvement wherein the polyisocyanate used is a polyisocyanate mixture containing from 10 to 80% by weight of 2,4'-diisocyanatodiphenylmethane.

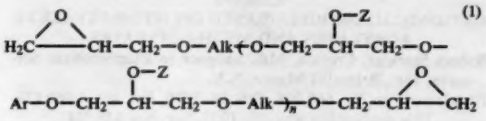
4,163,096

EPOXY RESIN MIXTURE FOR THE PRODUCTION OF FLEXIBLE MOULDED ARTICLES

Wolfgang Seiz, Pfeffingen, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,859
Claims priority, application Switzerland, Nov. 2, 1977, 13351/77
Int. Cl.² C08L *63/00*
U.S. Cl. 528—69 **17 Claims**

1. A mixture of compounds of the formula I

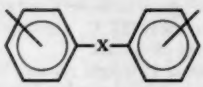


(1)

wherein

Alk—represents an alkylene group of 1 to 15 carbon atoms,

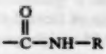
Ar—represents an unsubstituted or substituted o-, m- or p-phenylene group or a group of the formula



wherein the benzene nuclei can be substituted by halogen, alkyl or alkenyl of 1 to 4 or 2 to 4 carbon atoms respectively, and

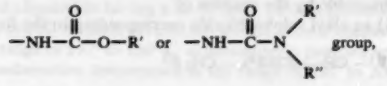
X—represents an alkylene or polyoxyalkylene group of 1 to 15 carbon atoms, a carbonyl, oxygen or sulfonyl bridge, and

n in the mixture is in general an integer from 0.3 to 1.5, each Z independently of the other represents hydrogen or the group

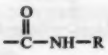


wherein R represents an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group containing 5 or 6 carbon atoms in the ring, an aralkyl group of 7 to 10 carbon atoms or a phenyl group

which is unsubstituted or substituted by halogen and/or lower alkyl groups, and the above groups can also contain a



in which R′ and R″ represent an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group containing 5 or 6 carbon atoms in the ring, an aralkyl group of 7 to 10 carbon atoms or a phenyl group which is unsubstituted or substituted by halogen and/or lower alkyl groups, but 50 to 100% of all the Zs represent the group



and the viscosity η of the mixture is not more than 20 Pas.

4,163,097

CROSSLINKABLE POLYMERIC COMPOUNDS

Niklaus Baumann, Marly; Hans Zweifel; Marcus Bauman, both of Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

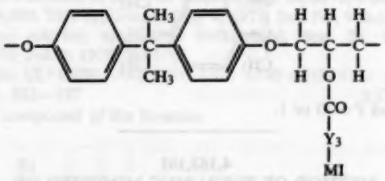
Division of Ser. No. 695,347, Jun. 14, 1976, Pat. No. 4,079,041. This application Dec. 27, 1977, Ser. No. 865,063

Claims priority, application Switzerland, Jun. 18, 1975, 7957/75; Nov. 27, 1975, 15391/75

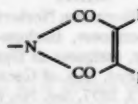
Int. Cl.² C08G *59/02*

U.S. Cl. 525—531 **6 Claims**

1. A polyether, which can be crosslinked under the action of electromagnetic waves, having an average molecular weight of 1000 to 1,000,000 as measured by viscometry of a solution of 0.2 gram of polymer in 100 ml of N,N-dimethylformamide, which is characterized by a structural formula comprising chain members of the formula

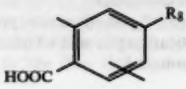


in which MI denotes the maleimido group of formula I



wherein R and R_1 independently of one another denote alkyl of 1 to 4 carbon atoms, or R and R_1 conjointly denote the remaining part of a five-membered to six-membered carbocyclic ring,

Y_3 represents an aliphatic, cycloaliphatic, carbocyclicaromatic, araliphatic, heterocyclic-aliphatic or heterocyclic-aromatic radical containing in each case, a total of at most up to 18 carbon atoms or denotes the grouping



and R_8 represents hydrogen, carboxyl or $—COO(CH_2)_zCH_3$ where z is 0 to 18.

4,163,098

COATING COMPOUND BASED ON EPOXIDE RESIN, AN AMINE CURING AGENT, AND A HYDRAZONE MODIFIER

Helmut Zondler, Bottmingen, and Wolfgang Schneider, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

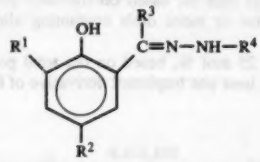
Filed Aug. 30, 1978, Ser. No. 938,190

Claims priority, application Switzerland, Sep. 5, 1977, 10802/77

Int. Cl.² C08G *59/62*

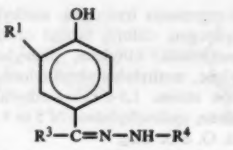
U.S. Cl. 528—99 **6 Claims**

1. A coating composition comprising an epoxide resin, a cycloaliphatic, aliphatic-cycloaliphatic or araliphatic diprimary amine curing agent and a modifier for the curing agent, which coating compound contains as modifier a hydrazone of the formula I



(I)

wherein R^1, R^2 and R^3 independently of one another represent hydrogen or an alkyl group having 1 to 12 carbon atoms, and R^4 represents hydrogen or an alkyl group having 1 to 4 carbon atoms, there being to 1 mol of the diprimary amine 1 to 2 mols of the hydrazone of the formula I, which can be replaced to the extent of 35 mol percent by a hydrazone of the formula II



(II)

in which R^1, R^3 and R^4 have the same meanings as in the formula I.

4,163,099

POLYESTERS PREPARED FROM NH CONTAINING CARBOXYLIC ACIDS

Lothar Buxbaum, Lindenfels, Fed. Rep. of Germany; Jürgen Habermeier, Pfeffingen, and Hans Batzer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 836,941, Sep. 27, 1977, abandoned. This application Mar. 22, 1978, Ser. No. 889,155

Int. Cl.² C08G *69/44*

U.S. Cl. 528—172 **22 Claims**

1. A linear thermoplastic polyester which has a relative viscosity of at least 1.30, measured on a solution of 1 gram of polyester in 100 ml of a solvent consisting of equal parts of phenol and symmetrical tetrachloroethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio

of diacids (a) and (b) with diols (c) and (d) so that the composition of the polyester comprises

(a) from 25 to 50 mol %, based on total polyester, of radicals of at least one dicarboxylic acid which contain NH groups and is of the formula I

$$HOOC—A—(CO)_n—NH—X—NH—(CO)_n—A—COOH \quad (I)$$

in which A represents o-phenylene, m-phenylene, p-phenylene, 1,4-naphthylene or 1,6-naphthylene,
n is 0 or 1, and
X, when n is 0, represents a radical of formula II

(II)

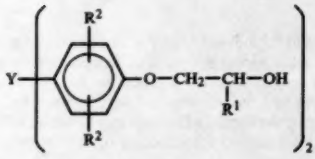
in which R is methyl, ethyl, cyclohexyl or phenyl, or
x, when n is 1, represents a divalent hydrocarbon radical of aliphatic or aromatic character;

(b) from 25 to 0 mol %, based on the total polyester, of radicals of terephthalic acid, isophthalic acid or a mixture thereof; and

in the diol component of the polyester

(c) from 0 to 25 mol %, based on the total polyester, of radicals of one or more diols containing aliphatic diol groups; and

(d) from 50 to 25 mol %, based on the total polyester, of radicals of at least one bisphenol derivative of formula III



(III)

in which R^1 represents hydrogen, methyl or ethyl, R^2 represents hydrogen, chloro, bromo or methyl, and Y represents methylene, ethylene, phenylmethylene, diphenylmethylene, methylphenylmethylene, alkylidene of 2 to 4 carbon atoms, 1,1-dichloroethylidene, 1,1,1-trichloroethylidene, cycloalkylidene of 5 to 8 carbon atoms, a direct bond, O, S or SO_2,
wherein the radicals (a) and (b) are attached to radicals (c) and (d) through ester linkages in a random distribution.

4,163,100

RAPIDLY CRYSTALLIZING POLYESTER COMPOSITIONS

Peter Bier, and Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 828,453, Aug. 29, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,710

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639428

Int. Cl.[2] C08G *63/70, 63/76*

U.S. Cl. 525—3 **6 Claims**

1. Rapidly crystallizing thermoplastic compositions comprising

(a) about 70 to 99.5% by weight of a high molecular weight polyalkylene terephthalate having an intrinsic viscosity of at least 0.6 dl/g (as measured on a 0.5% by weight solution in a mixture of phenol and tetrachloroethane in a ratio by weight of 1:1 at a temperature of 25° C.) and

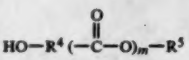
(b) about 0.5 to 30% by weight of a sulphonic acid ester obtainable by the reaction of

(1) an alkyl sulphochloride corresponding to the formula

$$R^1—CH_2—(CHR^2)_n—CH_2R^3$$

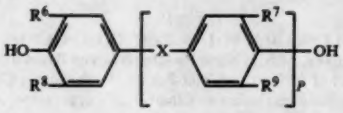
in which
R^1, R^2 and R^3 represent H, Cl, SO_2Cl and
n represents integers from 3 to 33 and the molar ratio of C to SO_2Cl is between about 35:1 and 1.25:1 with

(2) equivalent quantities of a compound corresponding to the formula



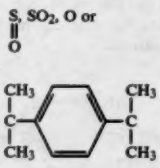
(I)

in which
R^4 represents a difunctional aromatic radical containing from 6 to 14 carbon atoms,
R^5 represents an alkyl, cycloalkyl or aryl radical containing from 1 to 20 carbon atoms and
M = 0 or 1, or



(II)

in which
R^6, R^7, R^8 and R^9 are the same or different and represent a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms, a chlorine or bromine atom, and
x represents a single bond, an alkylene or alkylidene radical containing from 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene radical containing from 5 to 15 carbon atoms, S,



and P = O or 1.

4,163,101

METHOD OF PREPARING MODIFIED OR UNMODIFIED POLY-(ALKYLPENTAMETHYLENETEREPHTHALAMIDE)

Gerhard Schade, Witten-Bommern; Norbert Vollkommer, Troisdorf, and Helmut Wemheuer, Bochum-Langendreer, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,338

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627342

Int. Cl.[2] C08G *69/28*

U.S. Cl. 528—347 **6 Claims**

1. A process for preparing a poly-(alkylpentamethyleneterephthalamide) having a relative viscosity of 1.38 to 3.35, measured in concentrated sulphuric acid at 25° C. at a concentration of 1 gram of polymer in 100ml of solution, which comprises heating an aqueous solution of the salt of

terephthalic acid and alkylpentamethylenediamine and a water soluble low molecular weight oligoamide of said terephthalic acid and said alkylpentamethylenediamine, the mixture of said salt and oligoamide having a 20–50 mole percent carbonamide groups and 50–80 mole percent salt groups, from a temperature in the range of 130° to 150° C. at atmospheric pressure up to a polycondensation temperature in the range of 250° to 300° C.

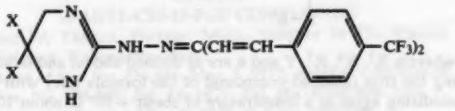
4,163,102

1,5-BIS(α,α,α-TRIFLUORO-P-TOLYL)-1,4-PENTADIEN-3-ONE (1,4,5,6-TETRAHYDRO-2-PYRIMIDINYL)HYDRAZONES

James B. Lovell, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 793,116, May 2, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,755
Int. Cl.[2] C07D *211/78;* A01N *9/22*
U.S. Cl. 542—417 3 Claims

1. A compound of the formula:



wherein X is hydrogen or methyl.

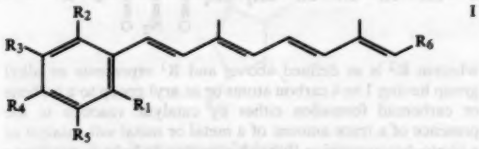
4,163,103

NOVEL DERIVATIVES OF 9-SUBSTITUTED PHENYL-3,7-DIMETHYL-NONA-2,4,6,8-TETRAENE

Werner Bollag, Basel; Rüdolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 816,409, Jul. 18, 1977, Pat. No. 4,107,190, which is a division of Ser. No. 613,676, Sep. 15, 1975, Pat. No. 4,054,589. This application May 8, 1978, Ser. No. 903,639
Claims priority, application Switzerland, Sep. 26, 1974, 13032/74; Jul. 9, 1975, 8962/75
Int. Cl.[2] C09F *5/00;* C11C *3/02, 1/00;* A01N *9/24*
U.S. Cl. 542—427 1 Claim

1. A compound of the formula:



I

wherein one of R_1 and R_2 is halogen or lower alkyl, and the other is halogen or lower alkoxy; R_3 and R_5 are hydrogen or halogen or lower alkyl; with the proviso that one of R_3 and R_5 is other than halogen; R_4 is halogen or lower alkoxy, amino, mono (lower alkyl) amino or di (lower alkyl) amino; and R_6 is alkanoyloxymethyl, carboxyl, alkenyloxycarbonyl, alkynyloxycarbonyl, or N-heterocyclylcarbonyl wherein the N-heterocyclyl moiety is selected from the group consisting of piperidino, morpholino, thiomorpholino and pyrolidino; and salts thereof.

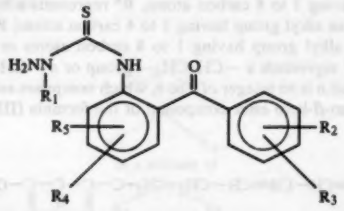
4,163,104

HETEROCYCLIC CONTAINING HYDRAZINECARBOTHIOAMIDES

Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 818,683, Jul. 25, 1977, which is a continuation-in-part of Ser. No. 769,125, Feb. 16, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,913
Int. Cl.[2] C07D *295/14*
U.S. Cl. 544—160 1 Claim

1. A compound of the formula



wherein R_1 represents a substituted lower alkyl wherein the substituent is selected from the group consisting of morpholino, piperidino or pyrollidino and R_2, R_3, R_4 and R_5 independently represent hydrogen, lower alkyl, halo or loweralkylthio.

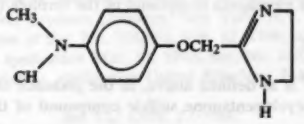
4,163,105

ARYLOXYMETHYL IMIDAZOLINES

Don V. Wysong, Farwell, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 16, 1975, Ser. No. 623,179
Int. Cl.[2] C07D *233/22*
U.S. Cl. 548—342 3 Claims

1. An aryloxymethyl imidazoline having the formula



and the pharmaceutically-acceptable salts thereof.

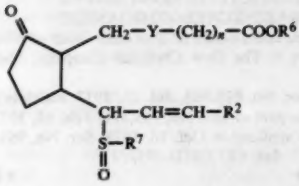
4,163,106

PROSTAGLANDIN PRECURSORS AND PROCESSES FOR PREPARING THE SAME

Kiyosi Kondo, Yamato, and Daiei Tunemoto, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

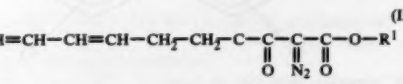
Filed Feb. 25, 1977, Ser. No. 772,053
Claims priority, application Japan, Feb. 25, 1976, 51-18839; Feb. 25, 1976, 51-18840; Feb. 27, 1976, 51-20078; Feb. 27, 1976, 51-20079; Mar. 1, 1976, 51-21163
Int. Cl.[2] C07C *177/00, 147/14*
U.S. Cl. 560—11 24 Claims

1. A process for preparing a compound of the formula (IId)



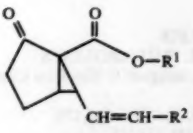
(IId)

wherein R^2 represents a substituted or unsubstituted alkyl group having 1 to 8 carbon atoms, R^6 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R^7 represents an alkyl group having 1 to 4 carbon atoms or an aryl group, Y represents a $-CH_2CH_2-$ group or a $-CH=CH-$ group, and n is an integer of 0 to 6, which comprises subjecting an α-diazo-β-keto ester compound of the formula (III)



(III)

wherein R^2 is as defined above, and R^1 represents an alkyl group having 1 to 4 carbon atoms or an aryl group, to a carbene or carbenoid formation either by a catalytic reaction in the presence of a trace amount of a metal or metal salt catalyst or a photodecomposition through exposure to light to produce a 6-alkenylbicyclo[3.1.0] hexanone compound of the formula (I)

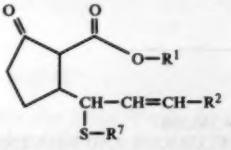


(I)

wherein R^1 and R^2 are as defined above, reacting the thus obtained 6-alkenyl-bicyclo[3.1.0]hexanone compound at from about 0° to about 100° C. with approximately equimolar amount of a mercaptan compound of the formula (V)

$$R^7\text{-SH} \qquad \text{(V)}$$

wherein R^7 is as defined above, in the presence of a base to produce a cyclopentanone sulfide compound of the formula (IIa)

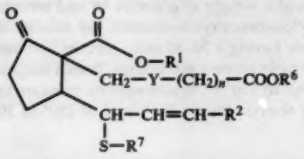


(IIa)

wherein R^1, R^2 and R^7 are as defined above, reacting the thus obtained cyclopentanone compound at from about −80° to about 150° C. with approximately equimolar amount of an alkylating agent of the formula (VI)

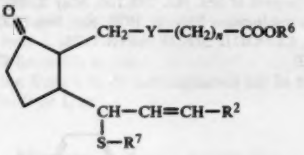
$$Z\text{-}CH_2\text{-}Y\text{-}(CH_2)_n\text{-}COOR^6 \qquad \text{(VI)}$$

wherein R^6, Y and n are as defined above, and Z represents a halogen atom, a tosyloxy group or an acyloxy group, in the presence of a base to produce a compound of the formula (IIb)



(IIb)

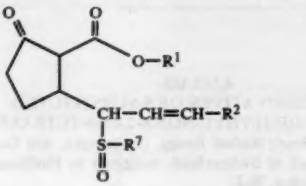
wherein R^1, R^2, R^6, R^7, Y and n are as defined above, subjecting the thus obtained compound of the formula (IIb) to either (1) heat-treatment at a temperature of about 50 to about 200° C. in the presence of an alkali metal compound and an inert polar solvent, or (2) an acid or alkali hydrolysis at a temperature of about 0° to about 150° C. followed by heat-treatment at a temperature of about 50° to about 200° C. to produce a compound of the formula (IIc)



(IIc)

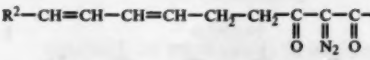
wherein R^2, R^6, R^7, Y and n are as defined above, and oxidizing the thus obtained compound of the formula (IIc) with an oxidizing agent at a temperature of about −80° to about 100° C. in an inert solvent.

17. A process for preparing a compound of the formula (IIe)



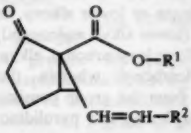
(IIe)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms or an aryl group, R^2 represents a substituted or unsubstituted alkyl group having 1 to 8 carbon atoms, and R^7 represents an alkyl group having 1 to 4 carbon atoms or an aryl group, which comprises subjecting an α-diazo-β-keto ester compound of the formula (III)



(III)

wherein R^2 is as defined above, and R^1 represents an alkyl group having 1 to 4 carbon atoms or an aryl group to a carbene or carbenoid formation either by catalytic reaction in the presence of a trace amount of a metal or metal salt catalyst or a photo-decomposition through exposure to light to produce a 6-alkenyl bicyclo [3.1.0]hexanone compound of the formula (I)

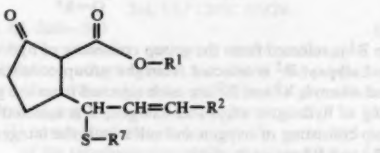


(I)

wherein R^1 and R^2 are as defined above, reacting the thus obtained 6-alkenyl-bicyclo[3.1.0]hexanone compound at from about 0° C. to about 100° C. with approximately equimolar amount of a mercaptan compound of the formula (V)

$$R^7—SH \qquad (V)$$

wherein R^7 is as defined above, in the presence of a base to produce a cyclopentanone sulfide compound of the formula (IIa)



(IIa)

wherein R^1, R^2 and R^7 are as defined above, and oxidizing the thus obtained cyclopentanone sulfide compound with an oxidizing agent in an inert solvent at from about −80° to about 100° C.

4,163,107

ω-ARYL-CIS-13-PGF COMPOUNDS

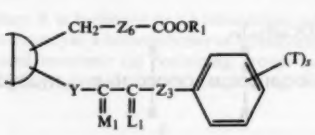
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,185

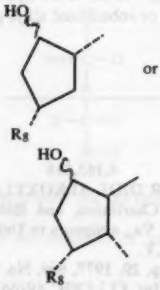
Int. Cl.[2] C07C *177/06*

U.S. Cl. 560—61 **37 Claims**

1. A prostaglandin analog of the formula:

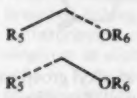


wherein D is

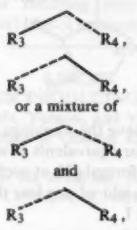


or

wherein R_8 is hydrogen or hydroxy;
wherein Y is cis-CH=CH—;
wherein Z_6 is
(1) cis-CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—$(CH_2$—, or
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,163,108

PROSTAGLANDINS

Roelof K. Beerthuis; David A. van Dorp, both of Vlaardingen, and Diederik H. Nugteren, Rhoon, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 704,551, Feb. 12, 1968, abandoned. This application Mar. 21, 1973, Ser. No. 343,269

Claims priority, application United Kingdom, Feb. 16, 1967, 7495/67

Int. Cl.[2] C07C *177/600*

U.S. Cl. 560—121 **10 Claims**

1. The prostaglandin which is a 1α-(6-carboxyhexyl)-4α-hydroxy-cyclopentan-2-one having in the 5β-position a 3S-hydroxy-n-alk-1t-enyl group of 7 or 9 carbon atoms, its pharmacologically acceptable carboxylic acid salt or its carboxylic ester with a Cto C_5 alkanol.

4,163,109

PROCESS FOR THE PREPARATION OF CYCLIC KETONES

Paul J. Teisseire, Grasse; Marcel Plattier, Antibes, and Edouard Giraudi, La Roquette sur Siagne, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

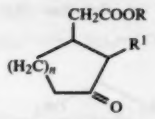
Filed Jul. 13, 1977, Ser. No. 815,213

Claims priority, application Switzerland, Jul. 16, 1976, 9136/76; Nov. 8, 1976, 14030/76

Int. Cl.[2] C07C *69/74, 67/32*

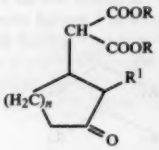
U.S. Cl. 560—122 **9 Claims**

1. A process for the preparation of compounds of the formula



I

in which R represents an alkyl group containing 1 to 3 carbon atoms, R^1 represents an alkyl or alkenyl group containing 3 to 6 carbon atoms and n represents 1 or 2, wherein a compound of the general formula



II

in which R, R^1 and n have the meanings given above is reacted with from 1 to 1.5 molar equivalents of water, per molar equivalent of compound of formula II, at such an elevated temperature as to produce a yield of not less than about 60% of the compound of formula I.

4,163,110

11-DEOXY-2,2-DIFLUORO-PGE COMPOUNDS

Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,222

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 **1 Claim**

1. 11-Deoxy-2,2-difluoro-PGE_2, methyl ester.

4,163,111

2-CYCLOPENTENONE DERIVATIVES

Sigeru Torii; Hideo Tanaka, and Yuichi Kobayashi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhim Kabushiki Kaisha, Osaka, Japan

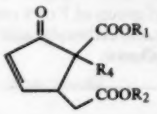
Filed Jun. 8, 1978, Ser. No. 913,745

Claims priority, application Japan, Aug. 12, 1977, 52/97171; Aug. 12, 1977, 52/97172

Int. Cl.[2] C07C *69/74, 61/20*

U.S. Cl. 560—122 **3 Claims**

1. A 2-cyclopentenone derivative represented by the formula



wherein R_1 and R_2 are lower straight-chain or branched-chain alkyl, alkenyl or aralkyl, and R_4 is 2-pentenyl or 2-pentynyl.

4,163,112

O-ALKOXY- AND ALKYLTHIOPHENYL CARBAMATES

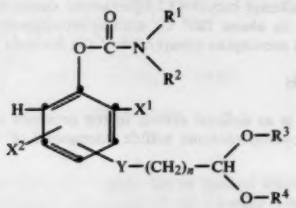
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,213

Int. Cl.[2] C07C *125/06;* A61K *31/27*

U.S. Cl. 560—132 **5 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen, alkyl and alkoxy; R^2 is selected from the group consisting of alkyl and alkenyl, X^1 and X^2 are each selected from the group consisting of hydrogen, alkyl and halogen; Y is selected from the group consisting of oxygen and sulfur; n is the integer 1 or 2; and R^3 and R^4 are each alkyl

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4,163,113

ESTER DIOL ALKOXYLATE ACRYLATES

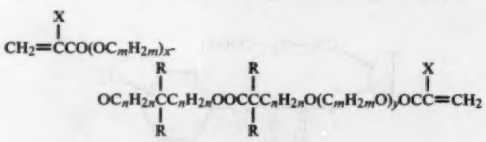
Robert J. Knopf, Saint Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,839

Int. Cl.[2] C07C *69/67*

U.S. Cl. 560—185 **10 Claims**

1. An ester diol alkoxylate acrylate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers having a value of from 1 to 20; X is a hydrogen or methyl; and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms.

4,163,114

ESTER DIOL ALKOXYLATES

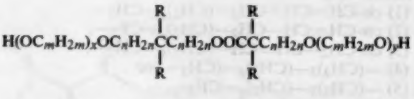
Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,838

Int. Cl.[2] C07C *69/66*

U.S. Cl. 560—186 **10 Claims**

1. An ester diol alkoxylate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers each having a value of from 1 to 20; and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms.

4,163,115
PREPARATION OF ESTERS OF POLY-(TETRAMETHYLENE ETHER) GLYCOL

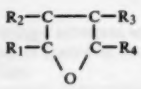
George E. Heinsohn, Newark; Ivan M. Robinson, Wilmington, both of Del.; Gerfried Pruckmayr, Media, Pa., and Walter W. Gilbert, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 751,211, Dec. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,555, Mar. 31, 1976, abandoned. This application Jan. 13, 1978, Ser. No. 869,272
Int. Cl.[2] C07C *67/24*
U.S. Cl. 560—240 13 Claims

1. A process for preparing ester end-capped poly(tetramethylene ether) glycol, or ester end-capped poly(tetramethylene ether) glycol copolymer, the process comprising

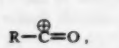
(A) bringing together, at a temperature of 0° to 120° C.,

(1) tetrahydrofuran, and optionally, up to 50% by weight of the tetrahydrofuran of a copolymerizable alkyl tetrahydrofuran represented by the structure



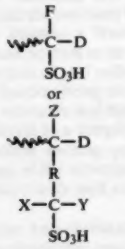
where any one of R_1, R_2, R_3 or R_4 is an alkyl radical of 1 to 4 carbon atoms, the remaining R's being hydrogen;

(2) an acylium ion precursor which is a compound capable of generating, under reaction conditions, an acylium ion represented by the structure



where R is hydrogen or a hydrocarbon radical,

(3) as a catalyst, a homopolymer of an ethylenically unsaturated monomer (a) containing groups such that the final polymer will contain groups of the formula



wherein ~~~ represents the polymer chain or a segment thereof;

D is hydrogen, an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, a halogen or a segment of the polymer chain;

X and Y are hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, but at least one of X or Y must be fluorine;

R is a linear or branched linking group having up to 40 carbon atoms in the principal chain; and

Z is hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms;

or a copolymer of monomer (a) with at least one other copolymerizable ethylenically unsaturated monomer (b), the homopolymer or copolymer being effectively free of functional groups which interfere with the reaction; and

(4) optionally, an aliphatic carboxylic acid of 1 to 36 carbon atoms; and then

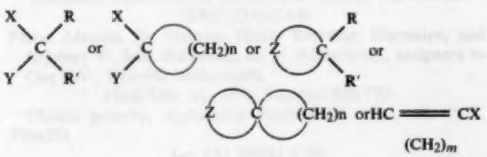
(B) separating the resulting ester end-capped poly(tetramethylene ether) glycol product from the reaction mass.

4,163,116
PROCESS FOR PRODUCING BISPHENOLS

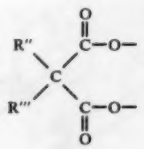
Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 10, 1978, Ser. No. 876,706
Int. Cl.[2] C07C *37/00, 37/12*
U.S. Cl. 568—723 11 Claims

1. A process for the production of bisphenols which comprises reacting a phenol containing at least one reactive hydrogen and a compound of the formula



wherein R and R′ are independently selected from the group consisting of hydrogen, lower alkyl or aryl; X is lower acyloxy; Y is lower alkoxy, aryloxy or the same as X; Z is the divalent radical



wherein R″ and R‴ are independently selected from the same group as R and R′, and n is an integer from 3 to 9; m=(n−1), or a mixture of such compounds, in the presence of a acidic condensing agent.

4,166,115

PREPARATION OF ESTERS OF PYRAZOLYL-(2)-TETRAMETHYLENE ETHER OR ETHYL

George E. Hilbertz, Newark, and Jay M. Robinson, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Sept. 6, 1977, Ser. No. 830,815

U.S. Cl. 260—326.5 FM 12 Claims

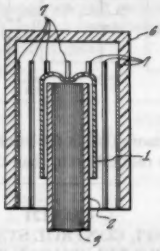
wherein R is hydrogen or a hydrocarbon radical.

4,163,117

HEAT-RECOVERABLE ARTICLES AND THEIR USE

Bruce D. Campbell, Redwood City, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 19, 1978, Ser. No. 897,805
Int. Cl.[2] H02G *15/04*; B29C *27/00*; B32B *31/00*; F16L *25/00*
U.S. Cl. 174—74 A 39 Claims



1. A method of covering a substrate with a covering member which is sealed around at least one section of said substrate, which method comprises

(1) providing an assembly comprising an elongate substrate and a covering member, said covering member comprising a heat-shrinkable band portion which has a closed cross-section and passes around a section of said substrate; said section of the substrate comprising an exterior wall portion composed of a first crystalline polymeric composition which has a gel fraction of at most 0.3 and a crystalline melting point T_1 and in which there is dispersed an absorptive material which absorbs electromagnetic radiation; and said band portion comprising a heat-shrinkable interior wall portion composed of a second crystalline polymeric composition which has a gel fraction of at least 0.3 and a crystalline melting point T_2 equal to at least $(T_1+5)°$ C. and in which there is dispersed an absorptive material which absorbs electromagnetic radiation; and (2) exposing the exterior of said heat-shrinkable band portion to electromagnetic radiation, said radiation and said absorptive materials and the amounts thereof being such that said band portion absorbs a fraction of said radiation which heats said band portion to its shrinkage temperature and transmits a fraction of said radiation, at least a portion of the transmitted fraction being absorbed by said exterior wall portion of the substrate and heating said exterior wall portion of the substrate to a temperature which is at least equal to its crystalline melting point T_1, whereby said interior wall portion of the covering member shrinks into direct sealing contact with said exterior wall portion of the substrate.

22. A generally tubular heat-shrinkable article which comprises at least one heat-shrinkable band portion which has a closed cross-section and which comprises a heat-shrinkable interior wall portion composed of a cross-linked polymeric composition, which composition comprises (a) a cross-linked crystalline olefin polymer having a gel fraction of at least 0.3, a density of at least 0.95 and a modulus at 175° C. of at least 40 psi, and (b) an infra-red-absorptive filler dispersed in said polymer in amount such that said band portion, when exposed to radiation having a wavelength of 1.15 microns, transmits 5 to 50% of the radiation.

35. An article comprising an electrical cable having an insulating jacket and a generally tubular covering member therefor, the covering member comprising a heat-shrinkable band portion which has a closed cross-section and which passes around a section of the insulating jacket, the insulating jacket being composed of a first polymeric composition comprising a crystalline olefin polymer having a crystalline melting point T_1 and a gel fraction of at most 0.3 and, dispersed in the polymer, an infra-red-absorptive filler; and the band portion being composed of a second polymeric composition comprising a cross-linked crystalline olefin polymer having a crystalline melting point T_2 which is at least (T_1+5) °C. and a gel fraction of at least 0.3 and, dispersed in the cross-linked polymer, an infra-red-absorptive filler in amount such that the band portion, when exposed to radiation having a wavelength of 1.15 microns, transmits 5 to 50% of the radiation, the amounts of infra-red-absorptive materials in the first and second polymeric composition being such that when the exterior of the heat-shrinkable band portion is exposed to infra-red radiation of a selected wavelength the band portion absorbs a fraction of the radiation which heats said band portion to its shrinkage temperature and transmits a fraction of the radiation which is absorbed by the section of the insulating jacket and heats the exterior thereof to a temperature which is at least equal to its crystalline melting point T_1, whereby the band portion shrinks into direct sealing contact with the section.

4,163,118

BUSBAR SYSTEM OF ELECTRIC HIGH-VOLTAGE SWITCHGEAR

Pieter Mariën, De Meeren; Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, all of Netherlands, assignors to Coq B.V., Utrecht, Netherlands

Filed Mar. 21, 1978, Ser. No. 888,779
Claims priority, application Netherlands, Apr. 19, 1977, 7704276
Int. Cl.[2] H02G *5/06*
U.S. Cl. 174—99 B 8 Claims

1. In a busbar system, the combination of:

a support and an insulator carried by said support;

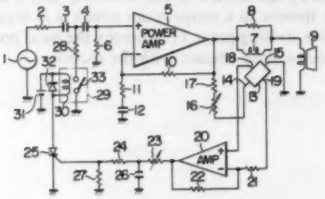
a busbar attached to said insulator in spaced relation to said support, said busbar comprising a pair of elongate, parallel rods, each having an inner face and an outer face, said outer faces being semicircular and said inner faces being disposed in spaced relation to each other so that said outer faces define a generally cylindrical envelope, said insulator having a portion disposed between said inner faces and said inner faces of the bars each having a longitudinally extending T-slot; and

means for attaching said busbar to said insulator, said means comprising a pair of bolts having their heads received in the respective T-slots of said bars whereby the attachment may be made at a selected longitudinal position along said busbar.

4,163,119
PROTECTIVE CIRCUIT FOR ELECTROACOUSTIC TRANSDUCER WITH HALL ELEMENT AND VOICE COIL TEMPERATURE RISE TIME CONSTANT CIRCUIT

Tatsuo Baba, Toyokawa; Yoshito Ohmura, Aichi; Hiroshi Fukushima, and Hideo Fukuma, both of Toyokawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 20, 1977, Ser. No. 834,901
Claims priority, application Japan, Sep. 27, 1976, 51-114762
Int. Cl.[2] H04R *3/00*
U.S. Cl. 179—1 F **10 Claims**



1. A protective circuit for an electroacoustic transducer which receives the output of a low-frequency power amplifier and converts the received output to a corresponding acoustic signal, comprising:

an inductive element for receiving the output signal of said low-frequency power amplifier and generating magnetic flux corresponding to the current of said output signal of said power amplifier, said electroacoustic transducer receiving through said inductive element said output signal of said low-frequency power amplifier;

a Hall-effect element having a pair of input terminals and a pair of output terminals, so disposed as to be subjected to the magnetic field induced by said inductive element;

means for supplying said output signal of said low-frequency power amplifier to said pair of input terminals of said Hall-effect element;

means for obtaining a Hall dc voltage corresponding to the power of said output signal of said low-frequency power amplifier from said pair of output terminals;

a time constant circuit having a time constant in accordance with the time constant of temperature rise in the voice coil of said electroacoustic transducer, for receiving said Hall dc voltage and delivering an output obtained by varying said Hall dc voltage depending upon said time constant; and

means for receiving the output voltage of said time constant circuit and shifting down the signal level of the low-frequency signal supplied to said electroacoustic transducer when said output voltage exceeds a predetermined level.

4,163,120
VOICE SYNTHESIZER

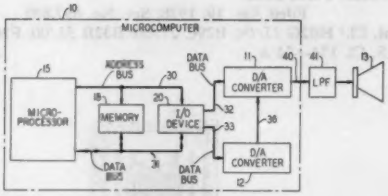
Milton Baumwolspiner, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 6, 1978, Ser. No. 894,042
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SM **6 Claims**

1. A voice synthesizer (FIG. 1) arranged with a memory (18) for storing basis functions (FIGS. 4A through 4L), each basis function including a set of data representing a speech waveform segment recorded at a basic storage rate and each basis function defining a waveform segment within a pitch period and including plural formants F1 and F2; the synthesizer BEING CHARACTERIZED BY

each basis function being represented by a data point plotted on a single line (46) on a chart having first and second formant log-log axes (FIG. 3), and

means (11, 12, 13, 15, 20, 30, 31, 32, 33, 36, 40, 41) for producing a speech waveform segment within the pitch period and approximately representing a data point located off of the single line (46) on the chart by selecting and reading

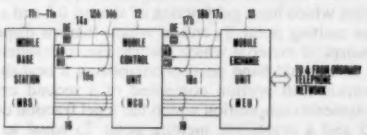


out of the memory (18) in the pitch period one of the basis functions at a rate different than the basic storage rate.

4,163,121
RADIO CHANNEL CONTROL SYSTEM FOR MOBILE RADIO TELEPHONE SYSTEMS

Noriaki Yoshikawa, Yokosuka; Hitoshi Komagata, Yokohama, and Yoshio Sato, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,061
Claims priority, application Japan, Aug. 30, 1976, 51-102612
Int. Cl.[2] H04Q *7/00*
U.S. Cl. 179—2 EB **20 Claims**



1. In a mobile radio telephone system of the type wherein a service area of the system is divided into a plurality of radio zones, base stations are installed in respective radio zones, each of said base stations is connected to a control unit respectively through a common control channel and a plurality of speech channels, and said control unit is connected to an ordinary telephone network, a radio channel control system comprising a plurality of signal lines for carrying signaling information extending between each of said base stations and said control unit, each signal line being associated with a corresponding one of the plurality of speech channels, and each of said speech channels including speech lines and signal lines for carrying signaling information concerning the associated speech channel.

4,163,122
METHOD AND APPARATUS FOR AUTOMATICALLY CORRECTING ERRORS IN A CYCLIC ROUTING MEMORY OF A TIME DIVISION MULTIPLEXED TRUNK EXCHANGE

Barend L. de Goede, Leidschendam, Netherlands, assignor to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefinie, The Hague, Netherlands

Continuation-in-part of Ser. No. 688,395, May 20, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,764
Claims priority, application Netherlands, May 22, 1975, 7506031
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT **10 Claims**

1. A method for automatically correcting errors in a cyclic routing memory of a four-wire TMD telecommunication exchange, comprising

(A) a switching means for switching the two channels of the

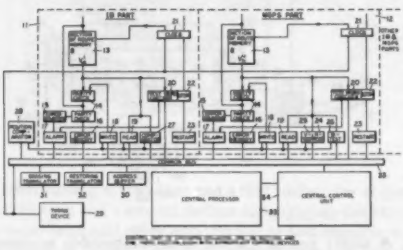
four-wire connection over two different switching paths, which switching part comprises:

1. an input means
2. a switching element
3. an output means

(B) a control means for controlling said switching means, which control means comprises:

4. a cyclic routing memory for consecutively establishing a plurality of switching paths between said input means and said output means via said switching element
5. a central control unit for providing the cyclic routing memory with switching data,

said method comprising:



(a) storing said switching data for the control of the two different direction switching paths of one connection in two separate columns of said cyclic routing memory for each switching path direction, and

(b) deriving lost switching data in one column for one switching path from the data of the other switching path of the same connection by

1. finding which direction path had the loss,
2. transforming the remaining data in said lost path to corresponding data in the other path direction,
3. finding the location of the path in said other direction which corresponds to the transformed data,
4. transforming the data from the other found path to reproduce the lost data, and
5. writing the lost transformed data into said lost path.

4,163,123

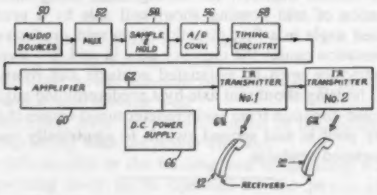
ELECTRONIC TOUR GUIDE SYSTEM

Harvey A. Brodsky, 9323 Lincolnwood Dr., Evanston, Ill. 60203, and William D. Becker, 1057 W. Belden Ave., Chicago, Ill. 60614

Filed Jun. 19, 1978, Ser. No. 916,857

Int. Cl.[2] H04J *3/08;* **H04B** *9/00*

U.S. Cl. 179—15 AL **23 Claims**



1. A tour guide system for use in a building such as a museum, art gallery or the like, comprising:

message source means having a plurality of channels of information signals comprising messages about exhibits or the like within the building;

means for multiplexing the channels of information signals and applying the information signals to one or more electrical conductors which extend throughout the building;

means located along the conductor for demultiplexing the plurality of channels of information signals and deriving a single channel of information signals in an exhibit area;

means associated with said demultiplexing means for converting said derived channel of signal information to frequency modulated infrared energy and transmitting the infrared energy into the area adjacent the exhibit;

portable receiver means being responsive to said infrared energy for converting the same to electrical signals and including means for transducing said electrical signals to sound, thereby enabling a user carrying said portable receiver means to listen to the message being received.

4,163,124

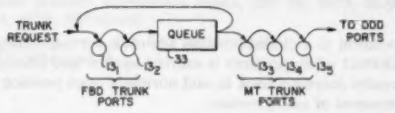
FINITE STORAGE-TIME QUEUE

Charles H. Jolissaint, Sunnyvale, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Jul. 24, 1978, Ser. No. 927,185

Int. Cl.[2] H04Q *3/64*

U.S. Cl. 179—18 D **16 Claims**



1. A method of queuing a plurality of serially generated communication link requests in a communication system having a plurality of calling stations and ordered groups of communication links, each group having a different priority level, said method comprising the steps of:

(a) sensing each of a plurality of serially generated communication link requests from a plurality of calling stations;

(b) scanning a first group of said communication links for availability of one of the communication links therein in response to said step of sensing;

(c) connecting the calling station associated to a given request to one of said communication links in said first group, if available;

(d) queuing said requests for a first fixed time period if none of said communication links in said first group is available during said step (b) of scanning;

(e) repeating said step (b) of scanning and said step (c) of connecting;

(f) sensing the number of requests queued;

(g) scanning a second group of said communication links for availability of one of the communication links therein when a request has been queued for said first fixed time period or the number of queued requests exceeds a first predetermined maximum; and

(h) connecting the calling station associated to the oldest queued request to one of said communication links in said second group.

4,163,125

PUSHBUTTON KEYBOARD SYSTEM

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 347,026, Apr. 2, 1973, Pat. No. 3,858,202, which is a division of Ser. No. 148,503, Jun. 1, 1971, Pat. No. 3,725,907. This application Jul. 29, 1974, Ser. No. 492,670

The portion of the term of this patent subsequent to Apr. 3, 1990, has been disclaimed.

Int. Cl.[2] H01H *13/70*

U.S. Cl. 200—5 A **3 Claims**

1. A keyboard having a plurality of normally open contact switches, said keyboard comprising:

a circuit board having first and second sides;

a plurality of spaced first electrical contacts, each contact extending through said circuit board from said first side of

said circuit board to said second side thereof and being electrically connected to selective circuits on said second side;

a plurality of second contacts, each formed as a curved resilient plate of electrically conductive material spaced from said first contact in a normally open position and having a peripheral edge along at least a portion of which said second contact is supported;

a contact support on said first side of said circuit board spaced from each of said first contacts and supporting said second contacts along at least a portion of their peripheral edges, said contact support being connectable to a potential, each of said switches completing a circuit upon deflection of the center of said plate from said normally open

position to a closed position against a corresponding first contact when pressure is exerted against said center, said center snapping back to said normally open position upon removal of said pressure;

an insulative element covering said first side of said circuit board to hold said second contacts in position with respect to said first contacts and to keep foreign material out of said contacts, said element including a layer of thin flexible material completely covering said second contacts;

a plurality of depressible keys; and

means for positioning said keys with one of said keys adjacent each of said second contacts with said layer of flexible material therebetween, each of said keys being selectively depressible to deflect a respective plate from said normally open position to a closed position.

4,163,126

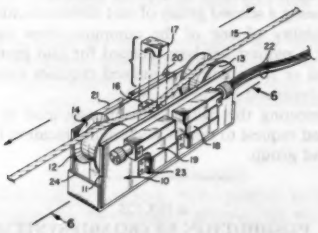
TENSION INDICATING DEVICE

Max Van Mastrigt, Tarzana, Calif., assignor to W. C. Dillon and Co. Inc., Van Nuys, Calif.

Filed Mar. 9, 1978, Ser. No. 885,000

Int. Cl.[2] B65H *25/14*

U.S. Cl. 200—61.13 **10 Claims**



1. A device for indicating when a tension in a rope has reached a predetermined value, including, in combination:

(a) a rigid frame having spaced rope guide means for engaging spaced points on the same side of said rope;

(b) means securing a portion of said rope between said spaced points and laterally displaced from a straight line between said spaced points so that the portions of rope extending generally in opposite directions from the point of securement define an angle with each other less than 180°;

(c) elongated bending beam means secured at one portion to said means securing a portion of said rope and said frame and at another portion to said rigid frame so that increased tension in said rope will deflect said bending beam means; and

(d) indicating means on said frame responsive to deflection of said bending beam means a predetermined amount defined by said predetermined value of tension.

4,163,127

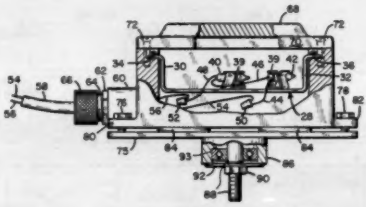
POSITION SENSITIVE SAFETY SWITCH

John W. Herou, Milaca, Minn., assignor to J. H. Electric Co., Inc., Princeton, Minn.

Filed Jan. 11, 1978, Ser. No. 868,701

Int. Cl.[2] H01H *35/00*

U.S. Cl. 200—61.47 **3 Claims**



1. A safety switch for use in a combustible environment, comprising:

(a) a box-like housing having a pair of end walls separated from one another by an integrally formed, spaced apart pair of side walls and having a bottom member bonded to a first edge surface of said side and end walls;

(b) a support bracket attached between said pair of end walls and wholly contained within said housing;

(c) first and second mercury-type switches each having spaced apart contacts and a pool of mercury enclosed in a sealed container, said switches being attached to said support bracket and having the longitudinal axes of their containers disposed along intersecting lines such that when said housing is mounted in a predetermined orientation said pool of mercury in each of said sealed containers electrically closed its associated contacts;

(d) a cover plate adapted to be attached to second edge surfaces of said pairs of side and end walls;

(e) a plate having first and second planar surfaces;

(f) resilient spacer means disposed on said first planar surface;

(g) a cylindrical tubular member disposed on said second planar surface and extending outwardly therefrom;

(h) an axle journaled for rotation within said cylindrical tubular member; and

(i) means for coupling said plate to said bottom member with said resilient spacer means abutting the outer surface of said bottom member, the arrangement being such that rotation of said housing about said axle by a predetermined angle in a first direction from said predetermined orientation causes the mercury pool in said first switch to electrically open its associated contacts and rotation of said housing about said axle by a predetermined angle in a second direction from said predetermined causes the mercury pool in said second switch to electrically open its associated contacts.

4,163,128

SAFETY BUCKLE WITH SWITCH

John S. Miskowicz, Rolling Prairie, Ind., assignor to Gateway Industries, Inc., Chicago, Ill.

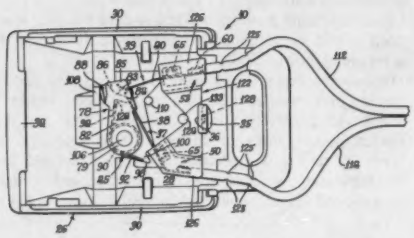
Filed Sep. 19, 1977, Ser. No. 834,248

Int. Cl.[2] H01H *3/20, 1/42;* A44B *11/26*

U.S. Cl. 200—61.58 B **8 Claims**

1. In a safety belt buckle, the combination comprising a buckle housing, a latch lever, opening means in said housing for receiving a latch plate to latch with said latch lever, switch

means in said housing for indicating the presence of said latch plate in said opening means, said switch means comprising a pair of flexible contact arms movable between an open position in which said arms are spaced apart and a closed position in which said arms touch, and a one-piece actuator for moving said arms between open and closed position, said actuator being pivotally mounted to said housing at one end and having a portion at the other end extending into said opening means



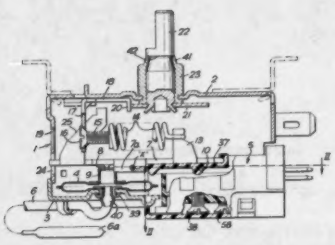
and further having at the other end a first surface for engaging one of said arms and a second surface for engaging the other of said arms to bend said other arm relative to said one arm when said actuator is moved, said first surface being disposed to cause said first one contact arm to slideably disengage from said second arm when said latch plate is inserted and then to shift said second contact arm further away from said first contact arm.

4,163,129

CONDITION RESPONSIVE CONTROL SWITCH UNITS

Guglielmo Rossi, Stutensee Friedrichstal, Fed. Rep. of Germany, and Vincenzo Ferloni, Lurate, Italy, assignors to Ranco Incorporated, Columbus, Ohio

Filed May 9, 1977, Ser. No. 794,721
Int. Cl.[2] H01H *35/24*
U.S. Cl. 200—81.4 **19 Claims**



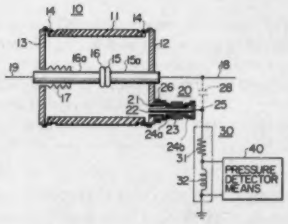
1. A control switch unit comprising:
a housing having a housing wall;
a fluid-filled power element mounted within the housing opposite said housing wall;
an operating lever pivotally mounted in the housing and cooperating with the power element;
a switch located in the housing and cooperating with the operating lever to be operated by the power element through the lever, both the power element and the switch being disposed on the same side of the operating lever and on opposite sides of the pivot axis of the lever;
a tension spring located within the housing and acting on the opposite side of the operating lever from the power element and the switch, said tension spring exerting a moment on the lever in opposition to the power element;
cam means acting upon the spring to adjust the tension thereof and to predetermine the operating point of the switch under control of the power element;
a setting shaft connected to the cam means for adjustment of the latter, said setting shaft being rotatable in said housing wall;
said cam means comprising a cam disc located within the hosing and attached to the cam setting shaft, and including a cam slider engaged by the cam disc, said cam slider carrying anchorage means for one end of the tension spring; and,
an auxiliary cam mounted on the cam setting shaft, a cam following mechanism operatively associated with the auxiliary cam, and an auxiliary switch within the housing, connected in series with the first switch, and engageable by said cam following mechanism.

4,163,130

VACUUM INTERRUPTER WITH PRESSURE MONITORING MEANS

Yoshiyuki Kubota; Yukio Kurosawa, and Hiroyuki Sugawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 23, 1976, Ser. No. 708,098
Claims priority, application Japan, Jul. 25, 1975, 50-90087; Dec. 3, 1975, 50/142940
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **14 Claims**



1. A pressure monitoring arrangement for use with a vacuum interupter having an envelope evacuated to a predetermined degree of vacuum and a pair of separable electrodes arranged in said envelope for connection to a high voltage circuit, comprising a pair of vacuum pressure detector electrodes supported in spaced insulated relationship to each other in communication with the interior of said envelope, one of said detector electrodes being conductively connected to said high voltage circuit, a series connection member which consists of the series connection of at least two different voltage allotment elements selected from the group consisting of a resistance, an inductance and a capacitor and having a voltage allotment ratio varied in dependence on frequency, said series connection member being connected between the other one of said detector electrodes and ground potential, and vacuum pressure detector means connected in parallel with a part of said series connection member for detecting a voltage produced by a change of current flowing through said series connection member, whereby said voltage is detected as a measure of the pressure of said envelope.

4,163,131

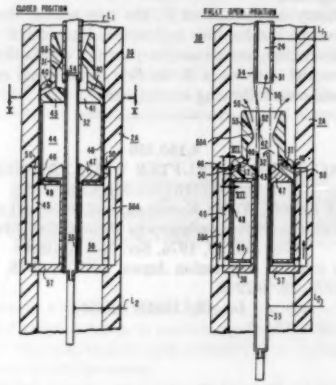
DUAL-COMPRESSION GAS-BLAST PUFFER-TYPE INTERRUPTING DEVICE

John F. Perkins, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1977, Ser. No. 823,820
Int. Cl.[2] H01N *33/88*
U.S. Cl. 200—148 A **14 Claims**

1. A dual-piston-acting gas-blast puffer-type circuit-interrupter comprising, in combination:
(a) means defining primary and secondary compression chambers,
(b) means for supplying arc extinguishing fluid to said primary and secondary compression chambers;

(c) means defining primary and secondary movable pistons movable within said primary and secondary compression chambers;
(d) means for moving said pistons;
(e) movable nozzle means movable with said primary and secondary movable pistons defining an arcing chamber;

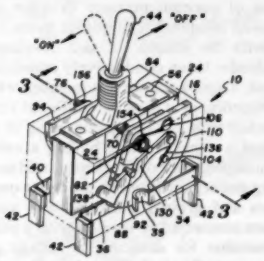


(f) a pair of separable arcing contacts separable to initiate an arc therebetween within said arcing chamber; and,
(g) valve means operable by the movement of said movable primary and secondary pistons to initiate separate flows of arc-extinguishing fluid from said primary and said secondary compression chambers into said arcing chamber.

4,163,132
DOUBLE-POLE SINGLE-THROW SWITCH

John J. Reiter, 6521 Stevens Ave. South, Minneapolis, Minn. 55423

Filed Nov. 23, 1977, Ser. No. 854,136
Int. Cl.[2] H01H *3/00, 21/04*
U.S. Cl. 200—153 M **10 Claims**

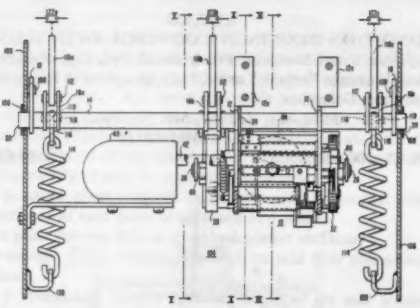


1. In an electric switch:
(a) a housing of insulating material having a recess in one face defining a bottom wall and side walls;
(b) a swivel plate having pivot means extending between opposed side walls, said swivel plate being disposed in said recess generally transverse to said opposed side walls;
(c) first and second side plates aligned parallel to said opposed side walls and fixedly secured to opposed side edges of said swivel plate for movement therewith, at least one of said side plates having a latch pin extending outwardly therefrom toward said opposed side walls;
(d) first and second rocker plates mounted outwardly of said first and second side plates on said pivot means for at least limited rotation thereabout, said rocker plates having the general shape of a segment of a circular disc and at least one of said rocker plates having an arcuate notch formed inwardly from one radial edge thereof for receiving said latch pin on said one of said side plates when said rocker plate is in a first orientation relative to said one of said side plates;
(e) spring biased latch means coupled to said one of said first and second rocker plates and adapted to cooperate with said latch pin on said one of said side plates;
(f) spring means operatively connected between said housing and said one of said first and second rocker plates for normally urging said one rocker plate to a predetermined orientation with respect to said housing;
(g) switch actuating means affixed to said housing and coupled to said swivel plate and movable between a first and a second position; and
(h) first and second sets of electrical contacts disposed in said recesss proximate said bottom wall and said opposed side walls and generally aligned with said first and second rocker plates such that during at least a portion of the travel of said rocker plates, said contacts of said first set are separately said first rocker plate and said contacts of said second set are separated by said second rocker plate.

4,163,133
CIRCUIT BREAKER APPARATUS INCLUDING JACK SHAFT SUPPORT

Fred Bould, Edgewood Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 680,829, Apr. 28, 1976, abandoned.
This application May 18, 1978, Ser. No. 907,074
Int. Cl.[2] H01H *3/30*
U.S. Cl. 200—153 SC **5 Claims**



1. A circuit interrupter, comprising:
(a) a base;
(b) three separable main contact means disposed upon said base;
(c) three lever means, one for each of said separable main contact means interconnected with said contact means for moving said contact means;
(d) rotatable jack shaft means for moving said lever means, each end of said jack shaft means being disposed in thrust bearing relationship with said base for substantially bearing the thrust from the two outer of said three lever means as said contact means moves; and
(e) operating mechanism means disposed upon said base for moving said jack shaft means, said operating mechanism means comprising a pair of spaced support members, said operating mechanism means also comprising a cam the shaft of which is movably supported by said pair of spaced support members but which is disposed outboard thereof for actuating said jack shaft means to rotate in appropriate circumstances for thus moving said contact means, only one of said pair of support members also having a bearing surface thereon which engages said jack shaft means relatively near said middle lever means of said three lever means for substantially bearing the thrust of said middle lever means as said contact means moves, said middle

lever means also being disposed outboard of said pair of spaced support members.

4,163,134

SAFETY JUMPER CABLES

Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed Nov. 7, 1977, Ser. No. 849,310
Int. Cl.² H01H *13/08, 21/10*
U.S. Cl. 200—157 **15 Claims**

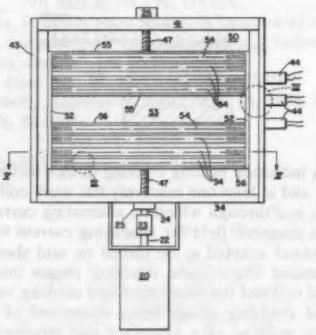
1. Jumper cable apparatus comprising;
a pair of electrical cables each having on either end clamp means enabling connection of the cables to battery terminals,
and switch means in at least one of said cables and having a connecting position and a disconnecting position,
each clamp means having an actuating handle and associated control switch at the handle operated by squeezing the handle.

4,163,135

HIGH CURRENT SWITCHES USING MULTI-LOUVERED CONTACT STRIPS

Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,590
Int. Cl.² H01H *3/40*
U.S. Cl. 200—158 **14 Claims**



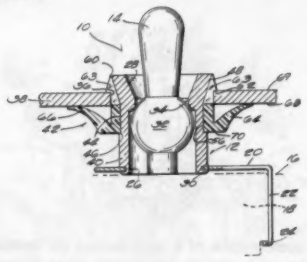
1. A switch for use in carrying at least 10,000 amperes comprising:
a plurality of stationary metal bus bars insulated from each other;
at least one movable metal bus bar with each of said stationary and movable bus bars having a switching surface which is flat, the switching surfaces of the plurality of the stationary bus bars being positioned so as to lie within a plane surface along which said movable bus bar may be moved to open and close electrical circuits, the flat switching surface of said movable bus bar being positioned facing toward and parallel to said plane surface and in contact with at least one of said stationary bus bars switching surfaces, the movable bus bar being configured so that when it is positioned overlapping portions of two stationary bus bars, current will flow from one stationary bus bar through the movable bus bar to the other stationary bus bar;
a plurality of contact strips making said contact positioned so that said current will flow through the contact strips between the movable bus bar and a stationary bus bar, each of said contact strips having a plurality of spring like contacts which press against the flat switching surfaces of both the movable bus bar and the adjacent stationary bus bars;
actuator means for moving the movable bus bar within said switch so that an electrical circuit may be opened and closed between different stationary bus bars through the contact strips and the movable bus bar.

4,163,136

SNAP-IN MEANS FOR MOUNTING ELECTRICAL DEVICES OR THE LIKE IN A SUPPORT PANEL APERTURE

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Continuation of Ser. No. 632,637, Nov. 17, 1975, abandoned.
This application Mar. 16, 1977, Ser. No. 777,962
Int. Cl.² H01H *13/04*
U.S. Cl. 200—296 **8 Claims**



1. A snap-in mounting means for a device adapting the device to be mounted from the back of and through a hole in a support panel to secure the device to the panel so that part of the device is accessible from the front of the panel comprising
an elongated bushing carrying the accessible part of the device and adapted to be received in the panel mounting hole, said bushing including a first shank portion, a second shank portion of a reduced outer dimension, a radially extending shoulder integrally connecting said first and second shank portions and an enlarged camming section extending from the outer extremity of said second shank portion; a grommet including a radically yieldable sleeve slidably and stretchably mounted on said first bushing shank portion to form a subassembly and a radially outwardly tapered locking collar on the outer end of said sleeve, said grommet being axially spaced inwardly from said bushing camming section so that said bushing camming section initially extends beyond the outer end of said grommet, said sleeve terminating in an inner edge and having an outer dimension less than the dimension of the panel mounting hole to allow insertion of said subassembly partly through the hole, said locking collar having a cross section intermediate its ends approximating, but less than, the dimension of the panel mounting hole and terminating at the inner end in a shoulder extending radially outwardly from said sleeve to a dimension larger than the panel mounting hole, and
biasing means for urging said grommet in an axial direction away from the back of the panel,
said bushing and grommet subassembly being insertable as a unit through the panel mounting hole to compress said locking collar radially inwardly and permit passage thereof through the panel mounting hole and to stress said biasing means against the back of the panel with said

locking collar thereafter expanding to its normal position where said locking collar shoulder engages the front side of the panel, said bushing being axially movable to permit it to be pulled back to slide axially within said grommet sleeve for engaging said bushing camming section with the interior of said grommet sleeve to cam said grommet sleeve radially outwardly into engagement with the inner edge of the panel mounting hole and further expand said locking collar on the front of the panel and for slipping said grommet sleeve off said first shank portion onto said reduced second shank portion and snapping said inner edge into engagement with said bushing shoulder, said grommet thereafter cooperating with said biasing means to hold said locking collar shoulder in tight engagement with the front side of the panel.

4,163,137

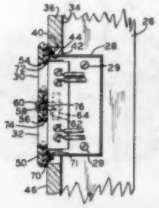
ELECTRICAL BOX SEAL CONSTRUCTION

Joseph B. Close, Jr., 3426 Rockwood Dr., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 842,685, Oct. 17, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 926,000

Int. Cl.[2] H01H *9/04*

U.S. Cl. 200—302 **8 Claims**



1. In the combination of a wall having an opening therein and having an outer surface, an electrical box mounted in said opening, an electrical device mounted in said box and having a surface generally flush with said wall opening and at least one portion protruding outwardly from said surface thereof and beyond said box and wall surface, a cover plate having a peripheral edge defining a shallow recess, and means for securing said cover plate to said device with said recess facing said box and with said edge engaging said wall surface surrounding said opening and defining a peripheral area therewith, said cover plate having at least one opening therein for receiving said portion of said device, the improvement comprising: a gasket for sealing around said opening and said device to prevent passage of air, said gasket comprising a thin sheet of flexible, air-impervious, material larger than said wall opening and smaller than said cover plate and having at least one opening therein for receiving said protruding portion of said device, said sheet having pressure sensitive adhesive on one side thereof and being adhered to said peripheral area of said wall and to at least a part of said surface of said device.

4,163,138

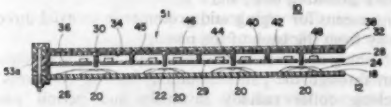
FLUSH LIGHTED FLAT KEYBOARD ASSEMBLY

Phillip L. Harden, Roanoke, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Mar. 17, 1978, Ser. No. 887,742

Int. Cl.[2] H01H *09/02*

U.S. Cl. 200—310 **15 Claims**



1. In a flat keyboard assembly comprising a support member having flat opposite sides, at least two spaced switches on one side of said support member each including a resilient, metallic momentary-contact switch element selectively actuatable from a first to a second position in response to force exerted thereon, a flexible switch actuator member having flat opposite sides with one side thereof in spaced facing relationship with said one side of said support member and said switch elements, said one side of said actuator member having at least two switch-actuating projections thereon respectively extending toward and in alignment with said switch elements, and a flexible keyboard member having flat opposite sides, one side of said keyboard member abutting the other side of said actuator member whereby force exerted on said keyboard member in general alignment with a said switch element deflects said keyboard member and actuator member thereby causing a said projection to apply actuating force on the respective switch element, a light source; means for mounting said light source adjacent said one side of said actuator member in the space between said switches and said one side of said actuator member and between said projections; conductors connected to said light source for energizing the same; said actuator member being formed of light-transmissive material, at least one selected area of said keyboard member being light-transmissive thereby being illuminated by said light source; and means for maintaining said support member and keyboard member in assembled relation.

4,163,139

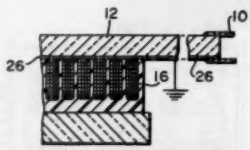
COOKING VESSEL CAPACITIVE DECOUPLING FOR INDUCTION COOKING APPARATUS

Terence D. Malarkey, Monroeville, and William C. Moreland, II, Export, both of Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 18, 1972, Ser. No. 290,045

Int. Cl.[2] H05B *5/04*

U.S. Cl. 219—10.49 R **11 Claims**



1. In an induction heating cooking device including a cook top sheet, and at least one relatively flat work coil underlying said sheet, and through which an alternating current flows to generate a magnetic field for producing current for heating a cooking vessel adapted to be placed on said sheet over said coil, grounded electrostatic shielding means interposed between said coil and the location of said cooking vessel on said sheet, said shielding means being comprised of electrically conductive material of a character and arranged to significantly reduce the capacitive coupling between said coil and said vessel without significantly reducing the inductive coupling between said coil and said vessel.

4,163,140

PLANT AND A PROCESS FOR SINTERING CERAMIC PRODUCTS

Gerard Bardet, Paris, France, assignor to Automatisme & Technique, Arcueil and Desnarquest et C., Montrouge, both of, France

Filed Aug. 24, 1976, Ser. No. 717,259

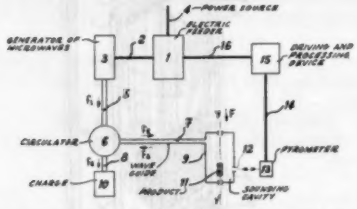
Claims priority, application France, Aug. 26, 1975, 75 26286

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **4 Claims**

1. A plant for sintering or melting ceramic or refractory products, comprising means provided with a cavity for receiv-

ing such products, an electric current supply, means for generating microwave power, means for feeding said current to said generating means, means for delivering said power to said cavity to heat a product therein, means for detecting the temperature of a product in said cavity and generating a corresponding electric signal, means for comparing said signal with a reference value and generating a differential electric signal, a driving electronic device responsive to said differential signal, means electrically connecting said device to said electric current feeding means for controlling said electric current feeding means to control the value of the microwave power delivered to said cavity to reduce said signal differential to zero, a coupling ring associated with said cavity, a detector with crystal connected with said ring for generating a voltage signal, an amplifying circuit for said voltage signal connected with said detector, a contactor with a predetermined threshhold value responsive to said amplified signal, and a driving electronic device provided with a time-circuit RC and connected with said contactor to interrupt delivery of said power to said cavity when the value of said amplified signal exceeds said predetermined threshhold, said last-mentioned driving electronic device restoring delivery of power to the cavity when the time determined by the time-circuit RC elapses after the amplified signal has fallen under said threshhold value.



4,163,141

MICROWAVE OVEN

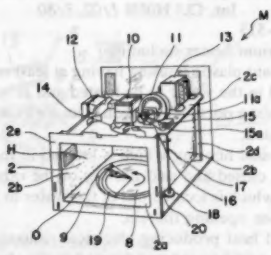
Junzo Tanaka, Fujidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1977, Ser. No. 787,460

Claims priority, application Japan, Apr. 14, 1976, 51-42844; Apr. 26, 1976, 51-47974

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 F **6 Claims**



1. A microwave oven comprising:

an oven defining structure;

a heating cavity within said oven defining structure, said heating cavity being defined by a base plate formed of a non-magnetic metallic material and by a top wall, a front wall having an access opening therein, a pair of side walls, and a rear wall, said walls being formed of magnetic metallic material, said base plate being joined at junctions to said front wall, said side walls and said rear wall;

door means for selectively opening and closing said access opening in said front wall;

means for supplying microwave energy into said heating cavity;

rotary table means, selectively and readily removably positioned to rotate in contact with a top surface of said base plate within said heating cavity, for receiving an object to be heated, said rotary table means being free of any fixed attachment to said base plate;

magnetic means, mounted below said base plate and exterior of said heating cavity, for rotating said rotary table means within said heating cavity; and

coating means, covering said junctions and said top surface of said base plate, except the orbital area thereof to be contacted by said rotary table means, for preventing corrosion of said heating cavity.

4,163,142

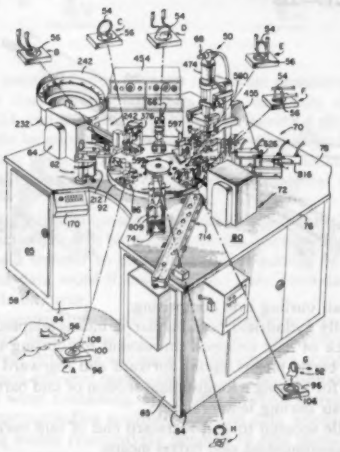
METHOD AND APPARATUS FOR ASSEMBLING RINGS

Theodore Descovich, Mahwah; Jack F. Smith, Kenilworth, and Edward D. Riordan, South Somerville, all of N.J., assignors to Avon Products, Inc., New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,615

Int. Cl.² B23K 11/02

U.S. Cl. 219—79 **57 Claims**



1. An apparatus for automatically assembling seriatim a ring from a ring shank and ring setting comprising:

apparatus supporting means;

advancing means operatively connected to said supporting means for supporting at least one work holding means which includes a nest member adapted for releasably holding said ring setting, and for successively and incrementally advancing said work holding means from a loading station to and through a plurality of discrete working stations, including ring shank placing station, bonding station, and bond testing station;

ring shank placing means located at said ring shank placing station for selectively placing said ring shank on the ring setting, said ring shank placing means including ring shank feeder means including a vibrating parts feeder having an exit ramp for receiving one after another a continuous succession of ring shanks discharged from said vibrating parts feeder and supporting said ring shanks throughout an elongated length of said exit ramp, track means connected to and supported by said apparatus supporting means, said track means being arranged to cooperate with said exit ramp for enabling said ring shanks to pass thereon from said track means, ring shank control means including indicating means operatively connected across said track

means for indicating when a predetermined quantity of ring shanks has been received by said track means and arresting means being actuatable by said indicating means for directing a stream of fluid pressure onto said exit ramp to prevent the passage of ring shanks to said track means, ring shank lifting means operatively connected to said apparatus supporting means for selectively lifting an individual one of said ring shanks from said track means and locating each said ring shank to a position to be grasped, and ring shank carriage means movable from said position at which it grasps said ring shank to a position at which said ring shank is adapted to be placed in said ring setting;

bonding means situated at said bonding station for selectively bonding the ring shank to the ring setting to form said ring; and

bond testing means situated at said bonding station for indicating good and bad bonds.

4,163,143

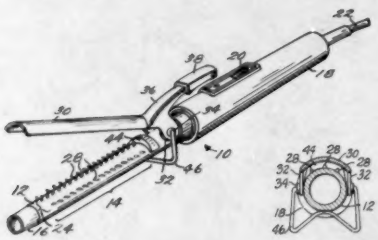
HAIRDRESSING DEVICE

Joseph J. Federico, 432 Avery Pla., Bellevue, Nebr. 68005, and William L. Gass, 2205 S. 86th St., Omaha, Nebr. 68124

Continuation-in-part of Ser. No. 875,171, Feb. 6, 1978, abandoned. This application Jul. 11, 1978, Ser. No. 923,691

Int. Cl.[2] H05B *1/00*; A45D *1/18*

U.S. Cl. 219—225 **8 Claims**



1. A hair curling iron comprising:

generally cylindrical heatable barrel means adapted to have a lock of hair wrapped thereabout for curling the same, said barrel means having forward and rearward ends;

means for heating a longitudinal section of said barrel means to hair curling temperature;

a handle secured to said rearward end of said barrel means for manipulating said barrel means;

a plurality of substantially pointed hair-combing teeth secured to and projecting generally radially from said barrel means along a circumferential segment of said longitudinal section;

a hair-confining member having an operative portion generally arcuate in transverse section and generally coextensive with said barrel means segment, said portion being adapted, in operative position, to overlie said barrel means segment in generally parallel relation and confine hair therebetween;

means pivotally mounting said member to said iron adjacent said barrel means rearward end for movement between said operative position and a non-operative position away from said barrel means segment;

manually manipulable operating means secured to said member and extending generally along said handle for pivotally moving said member between said positions; and

stop means independent of said teeth provided on one of said member and said barrel means for maintaining a predetermined spaced relation between said member and said barrel means and between said members and the ends of said teeth in said operative position of said member to minimize clamping pressure by said member on hair confined between said member and said barrel means.

4,163,144

HEATED DOORS

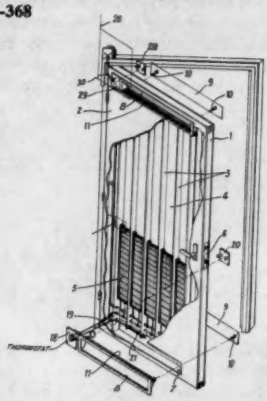
Jacques A. Réynier, Limoges, France, assignor to Elmetherm, Saint-Auvent, France

Filed Apr. 23, 1976, Ser. No. 679,697

Claims priority, application France, Apr. 25, 1975, 75 12924; Dec. 31, 1975, 75 40204

Int. Cl.[2] E06B *5/00*; F24H *9/08*

U.S. Cl. 219—368 **15 Claims**



1. A heated door comprising, two spaced apart wood face panels, at least one of said panels having a lower fresh air inlet opening and an upper heated air outlet opening; means defining a plurality of chimneys between said face panels and extending along substantially the entire height of said panels, said chimneys comprising, a plurality of upright wood laths extending between the face panels and extending along substantially the entire height of said panels, and means securing the laths to said face panels in spaced apart relation width-wise of the door; the distance between two adjacent laths not exceeding 150 mm; electric heating element means in said chimneys in a lower third of said door for heating air in said chimneys to cause flow from said inlet opening to said outlet opening; and means for supplying electrical energy to said heating element means.

4,163,145

AQUARIUM HEATER

Paul C. Neff, 277 Park Ave., Antioch, Ill. 60002

Continuation-in-part of Ser. No. 910,091, May 30, 1978, abandoned. This application Jul. 19, 1978, Ser. No. 926,152

Int. Cl.[2] H05B *1/02, 3/80*

U.S. Cl. 219—523 **6 Claims**

1. An aquarium heater including:

a heat resistant plastic housing having at least one end which is located in the water to be heated and at least one other end, at least a portion of which is located out of the water to be heated,

said end of said housing which is located in the water to be heated is closed and said portion of the other end of the housing which is located out of the water to be heated has at least one opening therein,

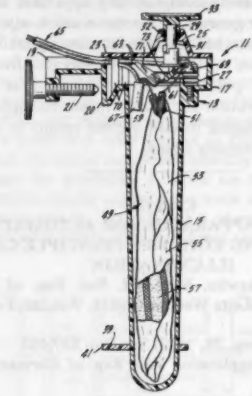
an insulated heat producing electrical resistance wire positioned in said housing and formed in the shape of at least one loop,

a metallic foil enclosing at least a part of said loop of insulated wire and positioned between said insulated resistance wire and all portions of said housing which are normally in contact with the water to be heated,

said metallic foil being formed and adapted to conduct and evenly distribute heat from the insulated electrical resistance wire to the plastic housing,

means to connect said insulated electrical resistance wire to a source of electrical current with said means extending

through said opening in the portion of the housing located out of the water, and



means to control the flow of electrical current through said insulated electrical resistance wire.

4,163,146

ELECTRICAL HEATING ELEMENT COMPRISING A HELIX OF WIRE WOUND ON AT LEAST ONE INSULATING PLATE

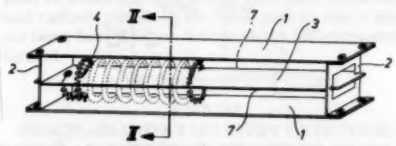
Klaus Meywald, Kandel, Fed. Rep. of Germany, assignor to Firma Fritz Eichenauer, Fed. Rep. of Germany

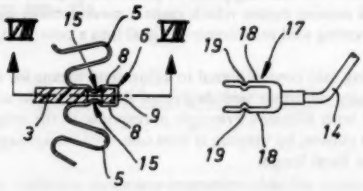
Filed Sep. 16, 1977, Ser. No. 834,052

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644093

Int. Cl.[2] H05B *3/06*

U.S. Cl. 219—542 **11 Claims**





1. A heating device comprising:

(a) at least one supporting plate of insulating material;

(b) a heating element comprised of a resistance heating wire which is bent in a meander shape formed of zigzag shape loops and wound in a helix about the supporting plate, said resistance heating wire being provided with opposed loops which are fitted over longitudinal edges of the supporting plate; and,

(c) voltage taps fitted on said loops secured to the longitudinal edges of the insulating material, said voltage taps being formed by bifurcate spring clips having a forked web and an electrical connector for enabling lower voltages to be tapped from said heating wire to power other components of the heating device.

4,163,147

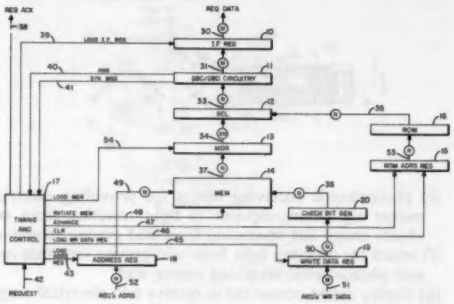
DOUBLE BIT ERROR CORRECTION USING DOUBLE BIT COMPLEMENTING

James H. Scheuneman, St. Paul, and John R. Trost, Anoka, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,048

Int. Cl.[2] G06F *11/12*

U.S. Cl. 235—312 **4 Claims**



3. In a semiconductor memory subsystem containing single bit error correction/double bit error detection circuitry, SBC/DBD, and a memory storage bank having a plurality of addressable locations of N bit data words, permitting access to a data word upon request and transferring said accessed data word to the requesting apparatus, the improvement comprising:

inhibiting means responsively coupled to said single bit error correction/double bit error detection circuitry for inhibiting said transfer to said requesting apparatus of said accessed data word if said accessed data word contains a double bit error;

complementing means responsively coupled to said memory storage bank and said single bit error correction/double bit error detection circuitry for sequentially complementing each different combination of two bit positions of said N-bit word containing said double bit error thereby creating corresponding modified accessed data words; and

enabling means responsively coupled to said memory storage bank, said single bit error correction/double bit error detection circuitry and said complementing means for enabling said transfer to said requesting apparatus of a one of said corresponding modified accessed data words whose two bit positions causing said double bit error have been complemented by said complementing means.

4,163,148

AUTOMATIC FOCUSING DEVICE PROBE COMPRISING A FOCUSING DEVICE AND METHOD OF FOCUSING A PROBE

Rainer Fritsche, and Helmut Ringelhan, both of Wetzlar, Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,454

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708507

Int. Cl.[2] G01V *1/20*

U.S. Cl. 250—201 **9 Claims**

8. A probe for examining an object such as an object within a hollow channel or bore comprising:

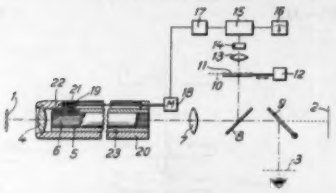
(a) an elongated tubular member adapted to be inserted into said channel or bore;

(b) a first focusing means positioned within said tubular

member proximate one end thereof for permitting positioning of said first focusing means adjacent said object to be examined;

(c) an optical fiber bundle positioned within said tubular member and aligned for receiving light from said object via said first focusing means;

(d) a grating structure positioned for receiving an image of said object, said grating structure having a grating constant whose spatial frequency is matched to at least one spatial frequency component of the spatial frequency spectrum contained in the structures of said object image;



(e) photoelectric receiving means for providing electrical output signals in response to light resulting from said object image and emanating from said grating structure;

(f) means for focusing light from said grating structure onto said photoelectric receiving means; and

(g) display means connected to receive said electrical output signals for providing a display of the position of said probe, whereby said probe may be positioned for providing a display of maximum light amplitude indicating a maximum focusing condition of said probe.

4,163,149

AUTOMATIC FOCUSING APPARATUS

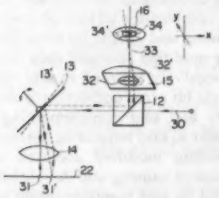
Susumu Sawano, Tachikawa, Japan; Yoshito Tsunoda, Stanford, Calif., and Takeshi Maeda, Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1977, Ser. No. 819,861

Claims priority, application Japan, Jul. 28, 1976, 51-89093; Aug. 9, 1976, 51-94001

Int. Cl.[2] G01J *1/36;*

U.S. Cl. 250—204 **14 Claims**



1. In an optical recorded information playback apparatus having a light source for generating a light beam; an information recorded medium; a first optical system which converges said light beam from said light source onto said information recorded medium; a photodetector which consists of four photodetection portions arranged in orthogonal pairs for converting the light beam from said recorded medium into respective electric signals; a second optical system including at least an optical element having a unidirectional lens action for directing the light beam from said recorded medium to said photodetector; first means responsive to a focusing signal for controlling a defocusing of said first optical system; and second means responsive to the difference between the combined electric signals generated from one pair of the orthogonal photodetection portions opposing one another in a longitudinal direction and the combined electric signals from the other pair of the orthogonal photodetection portions opposing one another in a lateral direction for generating said focusing signal according to the shape of the spot of said light beam on said photodetection portions; the improvement comprising

an automatic focusing compensating apparatus comprising third means for generating a compensation signal to compensate for a disturbance to the focusing signal in response to the difference between signals generated from the opposing pair of photodetection portions in at least one orthogonal direction and fourth means for applying said compensation signal to said second means to adjust the value of said focusing signal.

4,163,150

PROCESS AND APPARATUS FOR AUTOMATICALLY REALIZING KÖHLER'S PRINCIPLE OF ILLUMINATION

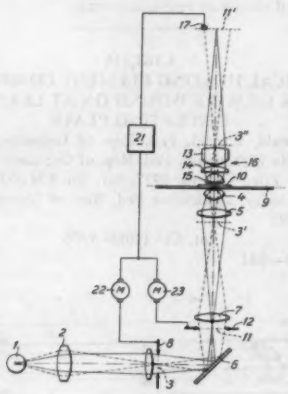
Hans-Werner Stankewitz, Steindorf, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,402

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644341

Int. Cl.[2] G01J *1/32*

U.S. Cl. 250—205 **22 Claims**



1. A process for automatically adjusting the illumination system of a microscope having a variable magnification system which comprises the steps of:

(a) measuring the extent of illumination of the viewable portion of the viewing plane or planes conjugated thereto with a sensing means which emits a measurement signal;

(b) converting said measurement signal into a control signal; and

(c) feeding said control signal to adjustment means for automatically adjusting said degree of illumination in accordance with Köhler's Principle in response to the magnification chosen, by varying at least one of (i) a diaphragm or (ii) the focal length.

4,163,151

SEPARATED ION SOURCE

John R. Bayless, Malibu; Robert L. Seliger, Agoura; James W. Ward, Canoga Park, and James E. Wood, Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1977, Ser. No. 865,280

Int. Cl.[2] B01D *59/44;* H01J *39/34*

U.S. Cl. 250—296 **3 Claims**

1. A high current separated ion source comprising:

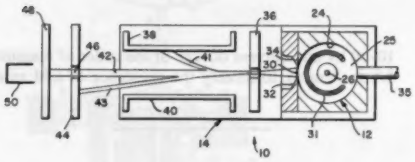
means for producing along a path a high aspect ratio substantially rectangular ribbon ion beam of substantially

rectangular cross section and having a height and a thickness;

magnetic field means for producing a magnetic field in the direction of the height of the beam across said path;

first and second separator electrodes positioned on opposite sides of said path laterally of said path in the thickness dimension of the beam for applying an electric field across said path, said separator electrodes being positioned with respect to said magnetic field means so that said electric field is transverse with respect to said magnetic field to separate unwanted ion species laterally from the ion beam;

said means for producing a ribbon ion beam comprising a cylindrical tubular cathode electrode and a central anode electrode therein, for defining a plasma discharge space within said cathode and around said anode which contains



gas to be ionized and through which electrons pass to ionize the gas, said means for producing a magnetic field also producing a magnetic field in said discharge space to lengthen the electron path in said discharge space to produce a Penning discharge;

walls defining a narrow rectangular slot opening in said cathode electrode through which ions are extracted to form the high aspect ratio substantially rectangular ribbon ion beam, said slot opening in said cathode electrode being oriented in a direction parallel to the axis of said cylindrical cathode; and

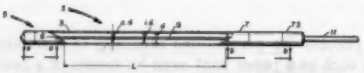
an accelerator electrode positioned adjacent to the beam path to accelerate ions which have been extracted from said cathode slot along the beam path so that a separated ion beam having an ion current above 100 microamperes is formed.

4,163,152

PENCIL-SHAPED RADIATION DETECTION IONIZATION CHAMBER

Arata Suzuki, Pittsburgh, Pa., assignor to Capintec Inc., Montvale, N.J.

Filed Sep. 26, 1977, Ser. No. 836,800
Int. Cl.[2] H01J *39/28*
U.S. Cl. 250—374 **17 Claims**



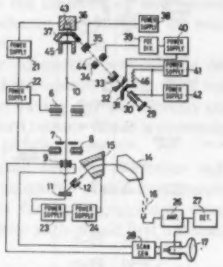
1. A radiation detection ionization chamber comprising an elongated cylindrical tubing forming an outer wall of the chamber and having a length along a major axis of the tubing substantially greater than the diameter of the tubing, an elongated center electrode disposed centrally along the major axis of the tubing, said tubing and said center electrode made of air equivalent plastic, a first electrical cable conductor, a second electrical cable conductor, cable connecting means at one end of said tubing for connecting one end of said center electrode to said first electrical cable conductor and for connecting said tubing to said second electrical cable conductor, end supporting means at the opposite end of said tubing for supporting the tubing and the opposite end of said center electrode within the tubing and comprising means for tensioning said center electrode between said cable connecting means and said supporting means.

4,163,153

ION BEAM MEANS

Hifumi Tamura, Hachioji, and Tohru Ishitani, Sayama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 17, 1977, Ser. No. 852,203
Claims priority, application Japan, Nov. 19, 1976, 51/138328
Int. Cl.[2] C01M *23/00*; H01J *27/00*
U.S. Cl. 250—423 R **7 Claims**



1. An ion beam apparatus comprising:

an ion source;

an ion-beam-focusing lens system for focusing a primary-ion-exciting ion beam emitted from said ion source;

an electrostatic deflector for deflecting said exciting ion beam;

a solid ion source adapted to emit ions upon receiving ion bombardment by said exciting ion beam;

an extracting electrode for extracting ions emitted from said solid ion source and;

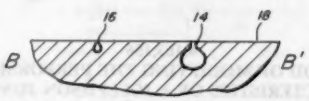
a controlling electrode disposed between said solid ion source and said extracting electrode, said controlling electrode having gaps for allowing said exciting ion beam and the ion beam emitted from said solid ion source to pass therethrough, respectively.

4,163,154

NEUTRON PERSONNEL DOSIMETER

Robert V. Wheeler, Lemont, and Richard A. Oswald, Berwyn, both of Ill., assignors to Technical Operations, Incorporated, Boston, Mass.

Filed Jul. 21, 1977, Ser. No. 817,696
Int. Cl.[2] G01T *1/04*
U.S. Cl. 250—473 **7 Claims**

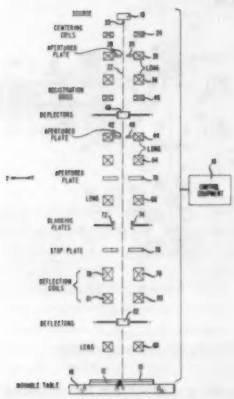


1. A method of neutron dosimetry which comprises the steps of exposing a dielectric track recorder to the products of (n,α) and carbon and oxygen recoil reactions so as to cause the formation in the track recorder of damage sites due to the resulting alpha particles and recoiling carbon atoms and oxygen atoms, developing those damage sites simultaneously in a way to distinguish the alpha-caused sites from the carbon/oxygen-caused sites, and from the so-developed damage sites determining the frequency of occurrence of each reaction.

4,163,155
DEFINING A LOW-DENSITY PATTERN IN A PHOTORESIST WITH AN ELECTRON BEAM EXPOSURE SYSTEM

David S. Alles, Covent Station; Alfred U. Mac Rae, Berkeley Heights, and Roger F. W. Pease, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1978, Ser. No. 894,420
Int. Cl.[2] A61K *27/02*
U.S. Cl. 250—492 B 5 Claims



1. A method of operating a raster-scan-mode-of-operation electron beam lithographic system to irradiate a workpiece (10, 12) that is supported on a continuously moving table (16), said method being CHARACTERIZED BY the step of

generating deflection signals that in effect exactly compensate for both table motion and the regular raster scan deflection signals of said system to cause the electron beam of dwell only on each of multiple selected portions of a low-density pattern for a time that is substantially greater than the time during which each portion would be exposed during regular raster scanning of the surface of the workpiece.

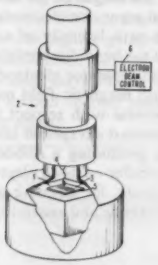
4,163,156
METHOD OF MODIFYING THE PERFORMANCE CHARACTERISTICS OF A JOSEPHSON JUNCTION

Kurt Daetwyler, Oberrieden, and Rudolf Jaggi, Langnau a/A, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 794,499, May 6, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 940,054
Claims priority, application Switzerland, May 19, 1976, 6234/76
Int. Cl.[2] A61K *27/02*
U.S. Cl. 250—492 B 7 Claims

1. A method of modifying the junction characteristics of a device capable of carrying Josephson current comprising the step of:

scanning an area of the junction region of said device with an electron beam of acceleration voltage in the range of

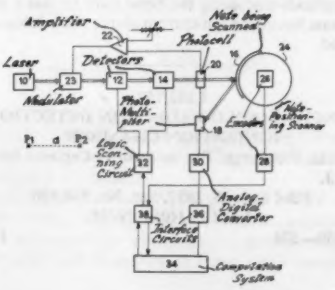


10–30 kv and current dosage of the order of magnitude of 1A sec/cm sq. to modify the resistance of said an area.

4,163,157
DATA MEDIUM SCANNING PROCESS AND APPARATUS

Claude F. Guignard, Plessis-Robinson, France, and Bernard J. Perrette, 2 Hameau des Colombes, Domaine, St. Francois d'Assise, 78 La-Celle-Saint-Cloud, France, assignors to Traitement de l'Information et Techniques Nouvelles, Morangis; Banque de France, Paris and Bernard Julien Perrette, La-Celle-Saint-Cloud, all of, France

Filed Aug. 1, 1977, Ser. No. 820,643
Claims priority, application France, Jul. 30, 1976, 76 23424
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 14 Claims



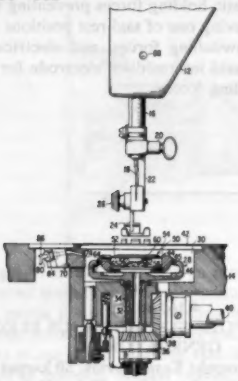
1. A process for parallel-line scanning of a moving data medium such as a paper bank note by means of a beam, said medium being transported with a definite speed, including the steps of measuring two coordinates of the location of a benchmark point of the moving medium with respect to two coordinates of a fixed point of reference, measuring the skew of a benchmark of the moving medium with respect to a fixed direction, computing the coordinates of the origin of a first scanning line from the coordinates of said benchmark point and according to the skew of said benchmark, computing the coordinates of the origins of the other scanning lines from the spacing desired between consecutive scanning lines and the origin of a previous scanning line and according to the skew of said benchmark, computing the skew of scanning lines according to the skew of the benchmark, scanning said medium so that the consecutive lines begin at the origins with the computing coordinates and are of the computed skew.

4,163,158

SEWING MACHINE BOBBIN THREAD RUN-OUT ALARM USING REFLECTED LIGHT

Donald J. Coughenour, Morristown; Jack Brown, Union, and John A. Herr, Garwood, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 25, 1978, Ser. No. 900,026
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 9 Claims



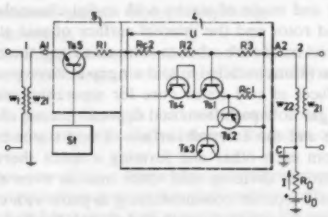
1. An apparatus for indicating the approaching end of a bobbin thread supply for a sewing machine comprising a bobbin having a core with a plurality of reflecting surfaces formed thereon, a light source for illuminating the reflecting surfaces on said bobbin core, a photodetector means for sensing light reflected from said reflecting surfaces, an electronic circuit for distinguishing between flashing light reflected from said bobbin core and ambient light, and signalling means controlled by said electronic circuit for advising a sewing machine operator when depletion of said bobbin thread exposes said reflecting surfaces on said bobbin core and causes light reflected from said bobbin core to flash.

4,163,159

ATTENUATION-FREE ELECTRONIC SWITCH

Erich Bächle, Ulm; Rudolf Schehrer, Geislingen and Dietrich Höppner, Blaustein-Wippingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 862,826
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657589
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—255 4 Claims



1. In an electronic switch defining a signal transmission path extending between two terminals each arranged to be connected at a respective point in a circuit, the switch being switchable between an OFF-state in which it presents a high impedance between the terminals and an ON-state, and the switch including components defining an open circuit stable negative resistance such that in the an ON-state signals are permitted to pass in both directions along the transmission path and provide attenuation compensation for such signals, the improvement wherein said negative resistance comprises:

a first transistor of a first conductivity type and a second transistor of the opposite conductivity type having its base connected directly to the collector of said first transistor;

a first resistor connected between the emitter and base of said second transistor;

a second resistor connected between the base of said first transistor and the emitter of said second transistor, with the point of connection between said resistors and the emitter of said second transistor constituting one terminal of said switch;

a third transistor of the first conductivity type having its base connected to the collector of said second transistor and having its collector connected to the emitter of said second transistor;

a third resistor connected between the base of said first transistor and the emitter of said third transistor;

a fourth resistor having one end directly connected to that end of said third resistor which is connected to the emitter of said third transistor; and

a diode connected between the other end of said fourth resistor and the emitter of said first transistor and poled to operate in its forward conduction direction when the collector-emitter path of said first transistor is conductive, and

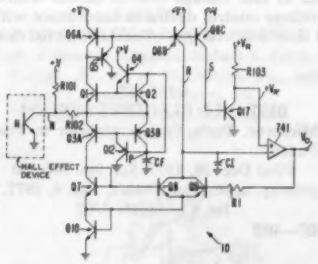
said switch further comprises a control transistor of the first conductivity type having its collector connected to the other end of said fourth resistor and whose emitter constitutes the other terminal of said switch, and switching control means connected to the base of said control transistor for supplying thereto a control signal which determines the conductive state of said control transistor and thus the switching state of said switch.

4,163,160

INPUT STAGE FOR AUTOMOTIVE IGNITION CONTROL CIRCUIT

Jerome A. Frazee, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 22, 1978, Ser. No. 889,152
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—260 11 Claims



1. An input stage circuit for supplying an output signal from an output node in response to an input signal supplied to an input node, said input stage circuit comprising:

a first and a second voltage supply for providing first and second reference voltages, respectively, wherein the first voltage supply is connected to the input node;

a first current divider for dividing a current flowing out of the input node into a first current and a second current;

a second current divider for dividing a current flowing into the input node into a third and a fourth current;

a first capacitor connected to be discharged by said first current and charged by said third current;

a second capacitor connected to be charged by said second current and discharged by said fourth current; and

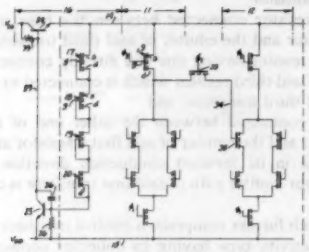
a voltage comparator connected to said second capacitor and to said second voltage supply for producing the output signal at the output node.

4,163,161

MOSFET CIRCUITRY WITH AUTOMATIC VOLTAGE CONTROL

Winston G. Walker, Irvine, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Nov. 24, 1975, Ser. No. 634,545
Int. Cl.[2] H03K *17/00*; G05F *1/40*
U.S. Cl. 307—297 **7 Claims**



1. An integrated circuit having a plurality of enhancement mode metal oxide semiconductor field effect transistor devices formed on a substrate of semiconductive material and conductors for applying a voltage to said devices, comprising

a voltage control device connected to control the voltage applied to said transistor devices through said conductors,

a group of additional enhancement mode metal oxide semiconductor field effect transistor devices formed on said substrate,

each of said additional devices having a drain,

a source, and

a control gate connected to said drain;

means connecting the drain of each of said additional devices except the last to the source of a succeeding one of said additional devices,

means connecting the source of the first of said additional devices to one of said conductors, and

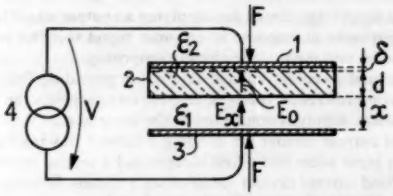
means connecting the drain of the last of said additional devices to said voltage control device whereby to bias said voltage control device in accordance with the combined threshold voltages of said additional devices.

4,163,162

BISTABLE ELECTRET SYSTEM

François Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 28, 1977, Ser. No. 865,330
Claims priority, application France, Jan. 4, 1977, 77 00075
Int. Cl.[2] H01G *7/02*
U.S. Cl. 307—400 **15 Claims**



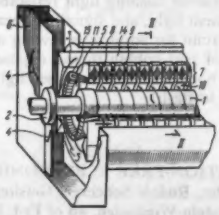
1. Bistable electret system comprising a pair of fixed electrodes forming a capacitor, a moving armature arranged between said fixed electrodes for occupying two rest positions respectively close to each of said fixed electrodes, at least one intermediate electrode integral with said moving armature, electrical biasing means connected to said electrodes for creating switching forces enabling said moving armature to move from one of said rest positions to the other and vice-versa, layers of electret material arranged in the gap of said capacitor for creating electrostatic holding forces preventing said moving armature from leaving one of said rest positions under the sole action of said switching forces, and electrical control means connected to said intermediate electrode for releasing said electrostatic holding forces.

4,163,163

NON-SALIENT POLE SYNCHRONOUS ELECTRIC GENERATOR

Elrikh I. Gurevich, prospekt Kosmonavtov, 50 korpus 4, kv. 72; Iosif F. Filippov, Pulkovskaya ulitsa, 17, kv. 39; Igor A. Prigorovsky, ulitsa Basseinaya, 53, kv. 4; Garri M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5, all of Leningrad, and Alexandr I. Vorontsov, ulitsa Khazova, 43, kv. 94, Leningrad-Pushkin, all of U.S.S.R.

Filed Apr. 6, 1976, Ser. No. 674,216
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—59 **6 Claims**



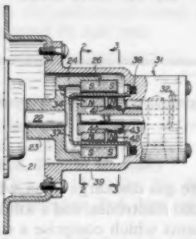
1. A non-salient pole synchronous electric generator comprising: a stator having a frame and a core mounted thereon; a rotor; fans installed on the end faces of said rotor and arranged to produce depression and pressure zones during operation; gas coolers having an inlet and an outlet and accommodated in said frame in close proximity to said fans and communicating with said pressure zone, said core of said stator being fitted around said rotor and made of stacks with radial channels therebetween, said rotor and the internal surface of said stator core being spaced from each other to form an air gap therebetween; circular partitions installed in said air gap in close proximity to said end faces of said stator core for separating said air gap along the gas flow path from said depression zone of said fans, said frame and the external surface of said stator core being spaced from each other and forming a space therebetween; radial partitions dividing said space into an even number of sections, said sections communicating in pairs with each other along the gas flow path through said air gap, the first section of each pair of communicating sections being arranged to introduce the gas flow into said radial channels of said core and communicating with the outlet from said gas coolers, the second section of each pair of communicating sections being arranged to discharge the gas flow from said radial channels of said core to said fans and communicating with said depression zone of said fans.

4,163,164

SPLIT MAGNET DRIVE

Ferdinandus A. Pieters, Walnut Creek, Calif., assignor to Micropump Corporation, Concord, Calif.

Filed Oct. 11, 1977, Ser. No. 841,034
Int. Cl.[2] H02K 7/11
U.S. Cl. 310—103 10 Claims



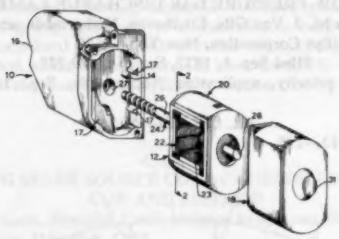
1. A magnetic drive comprising an annular first magnet, an annular second magnet in driving proximity to said first magnet, drive means for driving said first magnet, drive means driven by said second magnet, and an annular control member in proximity to one of said magnets, said control member being independent of rotation of said driven means, said control member having at least one position of movement when said control magnet is in frictional contact with one of said magnets, said first and second magnets each having a plurality of magnetic poles.

4,163,165

PERMANENT MAGNET MOTOR

James A. Purdy, Sylvania, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Aug. 18, 1977, Ser. No. 825,491
Int. Cl.[2] H02K 21/78
U.S. Cl. 310—154 5 Claims



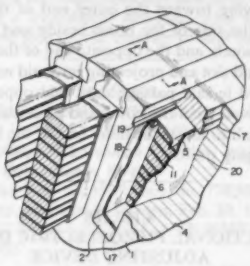
1. A permanent magnet motor comprising:
a stator assembly,
permanent magnet means mounted on said assembly,
an armature including an armature shaft rotatably supported at each motor end,
said shaft passing through said stator, said shaft and said stator being magnetically isolated at the point of passage and
said stator providing a homogeneous magnetic circuit for said permanent magnet means from substantially opposite sides of said armature, said circuit passing through at least one motor end and around said shaft,
said stator comprising a U-shaped member of low reluctance material, said member characterized by two substantially parallel sides interconnected by a bight, said armature shaft passing through a hole in said bight somewhat larger than said shaft, said parallel sides supporting said permanent magnet means, and additional magnetic material surrounding the hole in said bight.

4,163,166

FIELD WINDING ASSEMBLY FOR ROTOR IN ELECTRIC ROTARY MACHINE

Hiroyuki Kamiya, Hitachi; Ken Takahashi, Ibaraki; Seiji Watanabe, Hitachi, and Yasuyuki Wachi, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 21, 1977, Ser. No. 817,743
Claims priority, application Japan, Jul. 23, 1976, 51-88534
Int. Cl.[2] H02K 3/36
U.S. Cl. 310—215 8 Claims



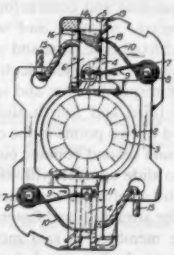
1. A field winding assembly for rotors in electric rotary machines which is mounted into an open slot formed in the rotor and secured by a wedge which is disposed in said slot closer to its open side, said field winding assembly comprising a conductor section mounted into said slot together with an insulator, said insulator including a lower insulating member of a substantially U-shaped cross-section for covering sides of said conductor section which are adjacent to bottom and side walls of said slot, and an upper insulating member of a substantially U-shaped cross-section for completely surrounding said conductor section in cooperation with said lower insulating member and having a base portion which is disposed adjacent to said wedge in said slot, and means provided in said base portion of said upper member to provide said upper insulating member with flexibility for lateral contraction and expansion, wherein said flexibility providing means comprises a plurality of grooves formed in said upper insulating member at both inner and outer surfaces of said base portion in positions offset to one another.

4,163,167

ELECTRIC MOTOR BRUSH HOLDER

Edward J. Zelt; William L. Dippold; Robert L. Gerg, and Raymond W. Klaiber, Jr., all of St. Marys, Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.

Filed Dec. 2, 1977, Ser. No. 856,661
Int. Cl.[2] H02K 13/00
U.S. Cl. 310—242 4 Claims



1. A brush holder comprising a frame having a central opening therethrough for the commutator of an electric motor, the frame being provided with a pair of brush housings beside said

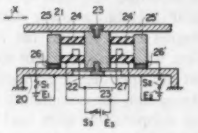
opening 180° apart, each housing having a passage therethrough with inner and outer ends, a brush slidably disposed in said passage, one side of said housing being provided with a longitudinal slot therethrough beside the brush, a stud projecting from said frame at said one side of the housing, and a torsion spring having a central coil encircling said stud and having end portions extending laterally away from the coil toward said housing with the free ends of the springs biased toward each other, the inner end portion of said housing having an abutment facing toward the inner end of the housing, one end of the spring engaging said abutment to prevent said end from moving toward the outer end of the housing, the outer end of the side of the brush beside said slot being provided with a notch, and the opposite end of the spring extending through said slot and projecting into said notch to hold the brush retracted in said passage until said opposite end of the spring is removed from the notch and placed against the outer end of the brush to move the inner end of the brush into commutator-engaging position.

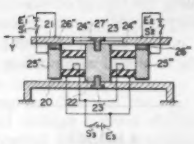
4,163,168

TWO-DIRECTIONAL PIEZOELECTRIC DRIVEN FINE ADJUSTING DEVICE

Isao Ishikawa, Hino, and Yoshio Sakitani, Saitama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1977, Ser. No. 820,011
Claims priority, application Japan, Jul. 28, 1976, 51-89092
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—328 **18 Claims**





1. A two-directional fine adjusting device comprising a fixed base, a movable plate, first and second counter piezoelectric members which are fixed to each other and which are expandable and contractable in directions different from each other in response to selective application of electric signals, first and second slide members which are respectively fixed to two points in the expanding and contracting direction of said first counter piezoelectric member and which come into slide contact with said fixed base, first and second electrical attraction means responsive to applied electric signals for attracting and fastening the respective first and second slide members to said fixed base, third and fourth slide members which are respectively fixed to two points in the expanding and contracting direction of said second counter piezoelectric member and which come into slide contact with said movable plate, third and fourth electrical attraction means responsive to applied electric signals for attracting and fastening the respective third and fourth slide members to said movable plate, means for selectively applying electric signals for expansion and contraction to the respective first and second counter piezoelectric members, and means for selectively supplying electric signals to said first, second, third and fourth electrical attraction means to effect operation thereof.

4,163,169

LOW-PRESSURE GAS DISCHARGE LAMP

Jan Hasker, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 534,206, Dec. 19, 1974, abandoned. This application Sep. 25, 1975, Ser. No. 616,653
Claims priority, application Netherlands, Jul. 11, 1974, 7409366
Int. Cl.[2] H01J *61/04*
U.S. Cl. 313—203 **16 Claims**

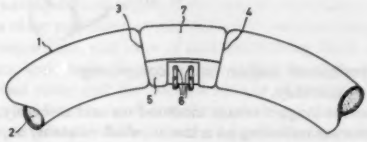
1. A low-pressure gas discharge lamp which comprises: an envelope, two spaced electrodes, and a solid state body having a plurality of elements which comprise a structure permeable to the discharge between said electrodes, said body extending over at least half the electrode distance and being thinly distributed over the discharge space, with oblique orientation of each of said plurality of elements to each of the rest of said plurality of elements of said body, the ratio between the volume of the body and the volume of the discharge space being between 0.6×10^{-6} f/lambda and 0.6×10^{-3} f/lambda where f represents the quotient of the volume and the area of said body in microns and lambda is a constant equal to 1 micron, said electrode distance divided by the average diameter of the cross-section of the discharge space perpendicular to the discharge axis being greater than five, said volume of said body being the sum of the volumes of all of said elements in said body, said area of said body being the sum of the area of all said elements of said body, said body being present over at least 80% of the electrode distance, and wherein as an average each cubic mm of the volume of the discharge space has disposed therein between 5×10^{-6} mg and 5×10^{-3} mg of the body.

4,163,170

LOW-PRESSURE GAS DISCHARGE LAMP

Wilhelmus M. J. Van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,735
Claims priority, application Netherlands, Sep. 14, 1976, 7610169
Int. Cl.[2] H01J *61/06*
U.S. Cl. 313—217 **1 Claim**



1. A low-pressure gas discharge lamp provided with an elongated curved lamp vessel having first and second ends disposed in opposed spaced relationship, an ionizable medium disposed in said vessel, each of said ends of said lamp vessel each including a feedthrough wire extending through said end, and a lamp base accommodating both of said ends, said base being manufactured of an electrically non-conducting material and engaging the axial extremities of said ends over less than half of the circumferential extent of said ends, said lamp base including first and second contact pins which extend at most from points proximate the center line of said lamp vessel in a direction generally perpendicular to and away from the center

line of said lamp vessel, said lamp further including electrically conducting filament extension pieces, each of said extension pieces being connected at right angles to one of said feedthrough wires near the center line of the lamp vessel outside the lamp base to the corresponding feedthrough wires, each of said filament extension pieces engaging one of said contact pins, said first and second contact pins being cylindrical and one of said extension pieces being disposed within each of said contact pins, said apparatus further including a cover cap extending about the circumferential extent of said ends of said lamp vessel not covered by said base.

4,163,171

HALOGEN CYCLE INCANDESCENT LAMP

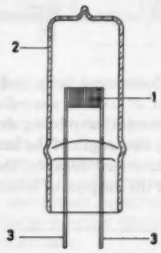
Ewald Wurster, Grünwald, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur Electrische Glumlampen mbH, Munich, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,536

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650298

Int. Cl.² H01K *1/32, 1/50*

U.S. Cl. 313—221 **7 Claims**



1. An incandescent lamp comprising a hermetically sealed hard glass envelope encasing a tungsten filament connected to lead wires hermetically sealed in said hard glass and containing an inert gas filling together with a halogen additive, said hard glass envelope consisting essentially of hard glass selected from the group consisting of aluminosilicate hard glass and borosilicate hard glass which contains substantially no alkali and carbon monoxide, and contains less than 0.03% by weight of water and less than 0.1 μliter/g carbon dioxide dissolved therein.

4,163,172

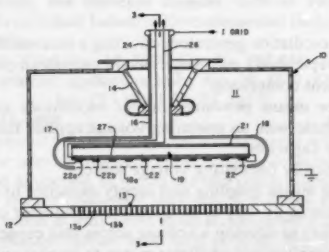
SLIDING SPARK SOURCE COLD CATHODE ELECTRON GUN AND METHOD

Gary K. Loda, Danville, Calif., assignor to Systems, Science and Software, Hayward, Calif.

Filed Jul. 8, 1977, Ser. No. 813,892

Int. Cl.² H01J *1/46, 21/10*

U.S. Cl. 313—302 **3 Claims**



1. A broad beam electron gun comprising: cold cathode means including an insulating substrate and a plurality of discrete electrodes disposed on said substrate to form a plurality of spark gaps therebetween lying along a path; anode means spaced from and juxtaposed with said cathode means; high voltage supply means connected between said cathode and anode means; cathode supply means for applying a voltage across said plurality of electrodes to generate a spark therebetween sequentially across each said gap resulting in the formation of a plasma in the space adjacent said cathode means, and a conductive strip spaced from and substantially coextensive with said electrodes for providing interelectrode capacitive coupling between said electrodes and said strip, said insulating substrate being a cylindrical insulator with said electrodes affixed along one side on the exterior of said insulator.

4,163,173

POROUS ELECTRODE BODY FOR ELECTRICAL ACCUMULATORS

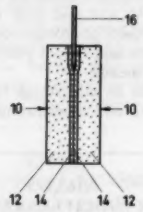
Sten B. C. Norling, Oskarshamn, Sweden, assignor to Nife-Jungner AB, Oskarshamn, Sweden

Filed Feb. 22, 1977, Ser. No. 770,950

Claims priority, application Sweden, Feb. 23, 1976, 20890/76

Int. Cl.² H01J *1/02, 1/14, 1/48;* **H01K** *1/04*

U.S. Cl. 313—352 **9 Claims**



1. A porous electrode body for electrical accumulators, which comprises at least two cohesive layers, at least one of which is a porous layer of sintered metal powder and at least one of which is a thinner layer of the same solid metal as that of the porous layer, which thinner layer is produced by fusion and solidification of one of the external surfaces of the adjacent porous layer.

4,163,174

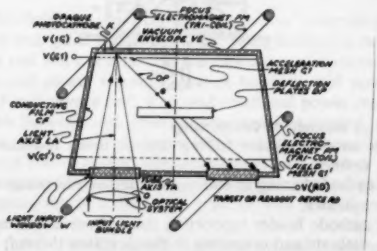
OBLIQUE STREAK TUBE

Charles B. Johnson, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Jun. 13, 1977, Ser. No. 805,955

Int. Cl.² H01J *39/07, 39/10*

U.S. Cl. 315—10 **6 Claims**



1. An oblique streak tube having a vacuum envelope with a longitudinal axis comprising:

means disposed in and at one end of said envelope responsive to light passing through the other end of said envelope along a light axis spaced from and parallel to said longitudinal axis to produce photoelectrons;

an accelerating mesh having a given potential applied

thereto disposed within said envelope adjacent said first means to rapidly accelerate said photoelectrons away from said means in a path toward said other end of said envelope at an angle oblique to said light axis and said longitudinal axis;

a field mesh having said given potential applied thereto disposed within said envelope and adjacent said other end of said envelope, said given potential applied to said accelerating mesh and said field mesh providing a region of constant potential between said accelerating mesh and said field mesh to enable deflection of said photoelectrons adjacent said path in said region, said photoelectrons having a constant velocity in said region;

readout means having a selected potential applied thereto greater than said given potential disposed in said other end of said envelope in said path adjacent said field mesh, said readout means being capable of providing an output photoelectron streak image for said tube, said given potential applied to said field mesh and said selected potential cooperating to accelerate said photoelectrons adjacent said path to said readout means;

magnetic means disposed externally of said envelope coextensive with said means and said readout means to provide a focusing magnetic field parallel to said path to focus said photoelectrons on said readout means; and

deflection plates disposed adjacent said path between said accelerating mesh and said field mesh in said region to deflect said focused photoelectrons across said readout means to produce said output photoelectron streak image on said readout means;

and means external to said streak tube for supplying said given potential to said accelerating mesh and to said field mesh.

4,163,175

MAGNETRON FOR WHICH LEAKAGE OF H.F. NOISE IS MINIMIZED

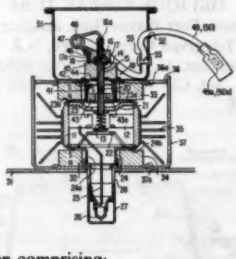
Norio Tashiro, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1978, Ser. No. 871,644

Claims priority, application Japan, Jan. 21, 1977, 52-5479; Nov. 4, 1977, 52-148002[U]; Nov. 9, 1977, 52-150126[U]; Nov. 11, 1977, 52-151166[U]; Nov. 11, 1977, 52-151167[U]

Int. Cl.[2] **H01J** *25/50*

U.S. Cl. 315—39.51 **18 Claims**



1. A magnetron comprising:

an anode cylinder having one or more resonant cavities defined therein;

a cathode having an end and located on the axis of the anode cylinder;

a cathode holder supporting the cathode at the end of the cathode and extending in the direction thereof;

magnetic means for providing a magnetic field substantially parallel to the axis in an interaction space defined between the resonant cavities and the cathode and the cathode holder;

an evacuated envelope member hermetically sealed with the anode cylinder and constituting an evacuated envelope in cooperation with the anode cylinder;

a heat conducting member connected thermally to the anode cylinder and located in the vicinity of the cathode holder; and

a high-frequency energy absorber located close to the cathode holder in an evacuated area defined by the evacuated envelope and being in contact thermally with the heat conducting member, wherein the high-frequency energy absorber is shielded against a magnetic flux generated from the magnetic means.

4,163,176

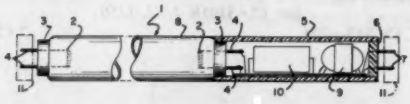
ENERGY SAVING FLUORESCENT LAMP

Sheppard Cohen, Danvers; Fredrick W. Paget, Rockport; William J. Roche, Merrimac; Tadius T. Sadoski, Salem, and Carlo S. Bessone, Cambridge, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,408

Int. Cl.[2] **H01J** *17/34, 61/56*

U.S. Cl. 315—53 **6 Claims**



1. An elongated fluorescent lamp and elongated extension base for use in a pair of sockets spaced a predetermined distance apart, the fluorescent lamp being shorter than said predetermined distance but the length of the lamp and extension base equalling said predetermined distance, the extension base containing an impedance the purpose of which is to reduce current flow in the lamp.

4,163,177

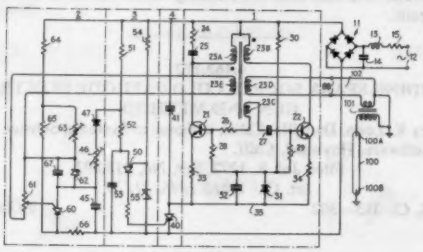
OSCILLATION GENERATOR PROVIDING OSCILLATIONS OF VARYING AMPLITUDE

Arthur R. Warner, 11, Portsmouth Rd., Kingston-upon-Thames, Surrey, and Derrick A. Ward, 1 High Beech, Croham Manor Rd., South Croydon, Surrey, both of England

Filed Oct. 17, 1977, Ser. No. 842,490

Int. Cl.[2] **H05B** *37/02;* **H03B** *3/02*

U.S. Cl. 315—208 **13 Claims**



1. In an oscillation generator providing a succession of oscillations of repetitively and progressively varying amplitude, the improvement comprising:

oscillator means providing output oscillations varying in amplitude with an operating voltage applied thereto;

a supply capacitor;

a periodically fluctuating voltage source;

charging means coupling said supply capacitor to said voltage source by way of an SCR (semiconductor controlled rectifier) to develop a voltage across said capacitor;

means coupling said oscillator means to receive said voltage across said capacitor as said operating voltage;

control means developing firing pulses of which the timing

with respect to said fluctuating voltage varies progressively in a cyclic manner;

and means applying said firing pulses to fire said SCR.

10. The invention claimed in claim **1** and further including means coupling said oscillations to an electric discharge lamp.

4,163,178

FLASH LIGHT DISCHARGE DEVICE

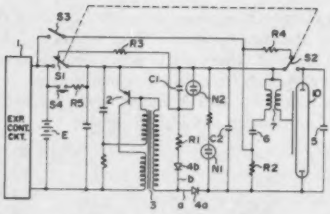
Tsutomu Hosono, Tokyo, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 18, 1977, Ser. No. 788,606

Claims priority, application Japan, Apr. 16, 1976, 51-43316; May 15, 1976, 51-61502[U]

Int. Cl.[2] **H05B** *37/00, 39/00, 41/14*

U.S. Cl. 315—241 P **7 Claims**



1. A flash discharge device comprising:

a blocking oscillator;

a first rectifier connected to said blocking oscillator to receive output signals therefrom and polarized to rectify output signals in one polarity;

a strobe circuit connected to said first rectifier and comprising a strobe tube and a main capacitor connected thereto to store electric charge supplied through said first rectifier to operate said strobe tube;

a second rectifier connected to said blocking oscillator to receive output signals therefrom and polarized oppositely from said first rectifier to rectify in the opposite polarity said blocking oscillator output signals applied to said second rectifier; and

voltage indicating means connected to said second rectifier to be energized by the oppositely polarized rectified signals therefrom,

said voltage indicating means comprising:

a neon tube,

a second capacitor connected in parallel with said neon tube,

a resistor connected in series with said second capacitor and said second rectifier, and

switching means connected to said voltage indicating means and said blocking oscillator to cause said neon tube to flash periodically and thereby periodically discharge said second capacitor while said blocking oscillator is operating to charge said main capacitor.

4,163,179

CIRCUIT FOR PROVIDING SAW-TOOTH CURRENT IN A COIL

Attilio Farina, and Giuseppe Zappala, both of Turin, Italy, assignors to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy

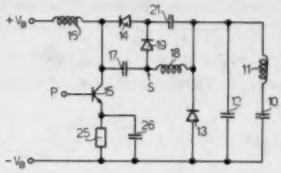
Filed Apr. 11, 1978, Ser. No. 895,413

Claims priority, application Italy, Apr. 29, 1977, 67959 A/77

Int. Cl.[2] **H01J** *29/70, 29/76*

U.S. Cl. 315—408 **10 Claims**

1. In a circuit for providing saw-tooth current with a trace and retrace interval in a coil, in particular a deflection coil of a television kinescope, in which the said coil is connected to a trace and retrace condenser with which it forms a resonant circuit; in which at least a first diode is connected in parallel to the said resonant circuit with such polarity that it is made conductive by the saw-tooth current during the first part of the trace interval; in which the said resonant circuit is also connected, through a second diode, to a controllable switch, with a control electrode, connected to a source of periodic signals which make it conductive at least during the last part of the trace interval, the said second diode being connected with such polarity that it is made conductive by the saw-tooth current during the last part of the trace interval; in which the said controllable switch is connected to a supply voltage source through a first inductor; and, finally, in which part of the energy stored in the said first inductor, during the interval in



which the said controllable switch is conductive, is transferred, during the retrace interval, to the said resonant circuit through a third diode, the improvement wherein means are provided, connected in series to the said second diode, the said controllable switch, the said first diode, and a first condenser connected in series between the said first diode and the said second diode, to produce, at least during the conduction interval of the said controllable switch, a d.c. voltage with substantially the same amplitude but with opposite polarity to the voltage produced at the terminals of the said first condenser.

4,163,180

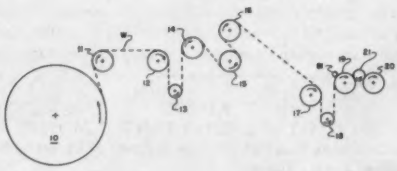
STRETCHABLE MATERIAL REWINDING MACHINE

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 750,469, Dec. 14, 1976, Pat. No. 4,103,840. This application Jan. 6, 1978, Ser. No. 867,230

Int. Cl.[2] **B65H** *61/00*

U.S. Cl. 318—6 **3 Claims**



1. A stretchable material rewinding machine comprising a plurality of web guide rolls along a web route between a material supply reel and a rewind reel, a rotational power source, a first rotational power transmission link between said power source and said supply reel, a second rotational power transmission link between said power source and said rewind reel and, motor speed control means for varying the rotational speed of said power source, the improvement comprising:

A. Pulse generating means for emitting an electrical pulse corresponding to a discrete length of web wound onto said rewind reel;

B. First pulse counting means for receiving and counting a first number of said pulses and transmitting a first speed control signal to said speed control means during a corresponding first counting interim, said first speed control signal ceasing at the end of said first counting interim;

C. Second pulse counting means for receiving and counting a second number of said pulses and transmitting a second speed control signal to said speed control means during a

corresponding second counting interim, said second counting interim beginning at the end of said first counting interim and said second speed control signal ceasing at the end of said second counting interim.

4,163,181

VARIABLE-SPEED ELECTROMOTIVE DRIVE, ESPECIALLY FOR HOUSEHOLD APPLIANCES SUCH AS DOUGH KNEADERS

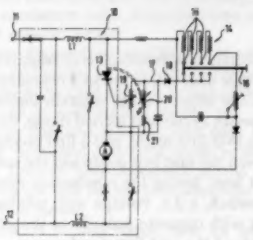
Karl-Heinz Farber, Giengen, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,703

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655574

Int. Cl.² H02P *5/40*

U.S. Cl. 318—245 **3 Claims**



1. In a variable-speed electric motor drive including a universal motor having a power supply line wherein a thyristor is connected and operated in a phase gating circuit, a firing circuit for the thyristor, a step-wise adjustable voltage divider having an output and with a plurality of fixed resistors and a slider by means of which the speed of the universal motor can be set step-wise to a desired speed, a control line extending from the voltage divider to the thyristor in which control line is a diode and another voltage divider in the form of a trimmer potentiometer for varying the rotary speed of the motor, and a temperature-dependent second resistance associated with the firing circuit and thermally coupled to the thyristor, said second resistance being shunted across said other voltage divider.

4,163,182

ACTUATING CIRCUIT FOR D.C. MOTOR

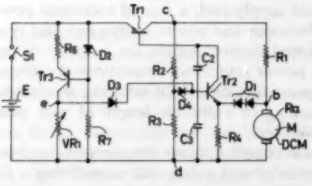
Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1977, Ser. No. 808,669

Claims priority, application Japan, Jun. 22, 1976, 51-73730; Jun. 22, 1976, 51-73732

Int. Cl.² H02P *5/00*

U.S. Cl. 318—331 **7 Claims**



4. A speed control device for D.C. motor comprising:

(a) an electric power supply circuit;

(b) a resistor bridge circuit having branches and output terminals, the resistor bridge circuit including the D.C. motor in one branch thereof and producing from the output terminals a first voltage corresponding to the speed of rotation of the D.C. motor;

(c) driving means connected between the electric power supply circuit and the resistor bridge circuit to supply driving current to said resistor bridge circuit;

(d) driving current control means coupled to at least an output terminal of the bridge circuit for controlling said driving means on the basis of said first voltage;

(e) a constant voltage circuit comprising a constant current circuit and variable resistor means connected in series with said constant current circuit for producing a desired output voltage, said constant voltage circuit being connected parallel to said electric power supply circuit; said constant voltage circuit having an output terminal and said driving current control means having an input terminal; and

(f) one-way conductive means connected between the output terminal of said constant voltage circuit and the input terminal of said driving current control means to apply an energizing voltage from said constant voltage circuit to the input terminal of said driving current control means at the time of actuation of said D.C. motor.

4,163,183

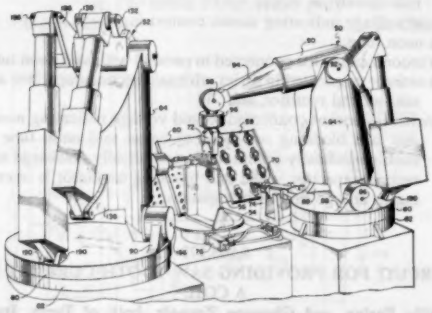
PROGRAMMABLE AUTOMATIC ASSEMBLY SYSTEM

Joseph F. Engelberger, Newtown; Torsten H. Lindbom, Brookfield; Maurice J. Dunne, Newtown; William Perzley, Weston; Wilbur N. Roberts, Newtown, and Horace L. Gardner, Ridgefield, all of Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed Oct. 28, 1975, Ser. No. 625,932

Int. Cl.² G05B *19/42*

U.S. Cl. 318—568 **78 Claims**

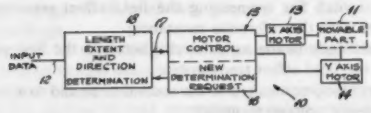


1. In a programmable manipulator the combination of, a manipulator arm, means for moving said arm to different positions in a plurality of independent axes, memory storage means for storing digital representations corresponding to different positions of said arm in said axes, encoder means for each of said axes and operative to develop position signals corresponding to the actual position of said arm is said plurality of axes, means controlled in part by said encoder means for calculating new digital representations during an initial teaching operation which are different from said position signals and correspond to a desired new position of said arm, and means for storing said calculated digital representations in said memory storage means.

4,163,184
ARCUATE MOVEMENT NUMERICAL CONTROL METHOD AND SYSTEM

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 4, 1974, Ser. No. 512,295
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—573 29 Claims

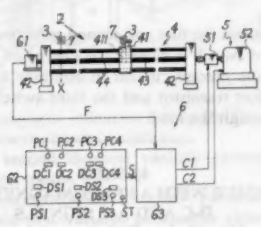


1. The method of producing actual relative movement along two coordinate axes with a minimum deviation from a commanded path comprising the steps of subdividing the movement into a plurality of successive lengths, normally providing a plurality of different possible extents for each length with the extent of each possible length being defined by a number of increments on each axis and with each possible length being no more than a set number of increments on each axis from the extents of the immediately prior length, selecting the extent which has the least deviation size, and producing a relative movement of the selected extent of the length with the movement for each length occurring over the same constant time interval for each length and in which the step of selecting includes the step of investigating the size of the deviation which would be produced by each possible length.

4,163,185
OBJECT LOCATING APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Aug. 6, 1976, Ser. No. 712,045
Claims priority, application Japan, Mar. 4, 1976, 51-24489
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—601 5 Claims



1. An apparatus for locating at a predetermined position along the length of a blade carrier the blades of a slitter-scorer for longitudinally slitting and scoring a web of material comprising:

a laser device remotely positioned out of engagement with said blade carrier for projecting a laser beam onto an adjacent blade carrier to indicate a predetemined position on said blade carrier at which a blade of said slitter-scorer should be positioned;

means for movably supporting said laser device along a line parallel to said blade carrier so that a plurality of predetermined positions may be indicated along said blade carrier at which a blade of said slitter-scorer should be positioned;

means for driving said means for movably supporting said laser device so as to move the laser device along said line parallel to said blade carrier;

said means for movably supporting said laser device includes means for tilting said laser device so as to project a laser beam onto an adjacent blade carrier which is not in the same plane as said means for movably supporting said laser device;

command means for initiating movement of the laser device along said line parallel to said balde carrier;

control means being programmed with a value representing the distance of said predetermined position along said blade carrier;

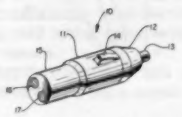
means for generating a signal representing the distance from a reference point that the laser device has moved along said line parallel to said blade carrier; and

means for comparing said signal with said value and generating a stop signal to said drive means to stop the laser device so that the laser beam is projected onto an adjacent blade carrier to indicate a predetermined position on said blade carrier at which a blade of said slitter-scorer should be positioned.

4,163,186
BATTERY STATE-OF-CHARGE INDICATOR

William E. Haley, 1430 Francis La., Plano, Tex. 75040

Filed Oct. 6, 1977, Ser. No. 839,929
Int. Cl.[2] G08B *21/00*
U.S. Cl. 320—48 15 Claims



1. A state-of-charge indicator for a battery comprising: a pair of current flow activated indicator means, first terminal means and second terminal means, a pair of transistors with collector elements serially connected through respective indicator means of said pair of current flow activated indicator means to said first terminal means, a common resistive member connected to the emitter elements of said pair of transistors with each transistor connected through said common resistive member to said second terminal means, first means biasing the base-emitter junction of said first transistor as the differential between a fixed reference potential and the voltage drop across said common resistive member, and second means biasing the base-emitter junction of said second transistor as the differential between a potential defined as a predetermined function of the voltage across said terminal means and the voltage drop across said common resistive member, and means for connecting said first and second terminal means to respective battery terminals.

4,163,187
ALTERNATOR HAVING SINGLE STATOR WITH DUAL WINDINGS AND COMPOUND OUTPUT

Serge J. H. Thomas, Paris, France, assignor to Motorola Automobile, Angers, France

Filed Dec. 31, 1975, Ser. No. 645,493
Claims priority, application France, Jan. 9, 1975, 75 00583
Int. Cl.[2] H02P *9/10*
U.S. Cl. 322—29 27 Claims

1. In an alternator for supplying rectified current at varying speeds having a rotor, a field winding on the rotor, a stator, the stator having slots for receiving stator windings, and output terminal wherein the improvement comprises:

a single stator having

at least one first stator winding received in the slots having

a first number of turns of wire of a first cross sectional area adapted to provide a predetermined voltage output at a first predetermined rotor velocity and to provide a current output at rotor velocities higher than a second predetermined velocity,

at least one second stator winding received in the slots having a second number of turns of wire of a second cross sectional area adapted to provide at a third predetermined rotor velocity a voltage output equal to the predetermined voltage output of the first stator winding, the second number of turns of wire being less than the first number of turns and the second cross sectional area being greater than the first cross sectional area,

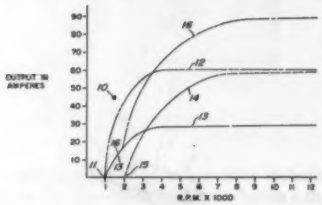
the third velocity being intermediate the first and second velocities,

the second winding being adapted to provide a current output substantially greater than the current output of the first winding at rotor velocities higher than the second velocity,

means for rectifying the outputs, and

means for adding the rectified output currents

whereby a compound curve output is provided at the alternator output terminals.



2. In an alternator as for an engine ignition system for supplying rectified current at constant voltage while operating at varying speeds, the system including an alternator having at least a rotor, a field winding on the rotor, and a stator, the stator being adapted to receive stator windings, the system comprising:

(a) at least one first stator winding adapted to provide a predetermined voltage output at a first predetermined rotor velocity, and adapted to provide a first current output at rotor velocities higher than the first predetermined velocity,

(b) at least one second stator winding having a voltage output lower than the predetermined voltage at the first predetermined rotor velocity, the second winding being adapted to reach the predetermined voltage at a second predetermined velocity, the second velocity being higher than the first predetermined velocity and the second winding being adapted to provide a current output greater than the output of the first winding at rotor velocities substantially higher than the second predetermined velocity,

(c) means for rectifying the outputs, and

(d) means for adding the rectified output currents to provide a continuous output current after the first predetermined rotor velocity is attained.

4,163,188

SYSTEM FOR ESTABLISHING AND STEERING A PRECISE CURRENT

Daniel D. Culmer, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 30, 1978, Ser. No. 910,508

Int. Cl.² G05F *1/56*

U.S. Cl. 323—4 **5 Claims**

1. A system for establishing a precise reference current and steering the precise reference current through a load, comprising

a first node;

a reference resistance connected between the first node and a common terminal;

means for maintaining a first reference voltage at the first node to establish a precise current flow through the reference resistance;

a field effect transistor having its source connected to a supply voltage terminal;

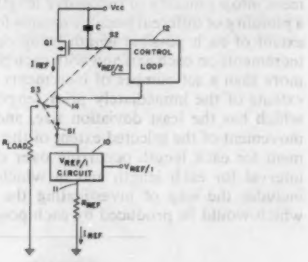
a capacitance connected between the source and the gate of the field effect transistor;

a first switch for connecting the field effect transistor in series with the reference resistance;

a second node in the series circuit between the first switch and the field effect transistor;

a control loop connected to the second node and to a second reference voltage terminal;

a second switch for connecting the control loop to the gate of the field effect transistor; and



a third switch connected to the second node for connecting the field effect transistor in series with a said load;

wherein when the first and second switches are closed and the third switch is open, the control loop causes the capacitance to be charged until the voltage at the second node matches the second reference voltage to thereby provide a voltage across the gate and source of the field effect transistor for sustaining the flow of the precise current from the field effect transistor and through the reference resistor;

whereby when the first and second switches are opened and the third switch is closed, the charge on the capacitance causes the precise current to continue to flow from the field effect transistor and the third switch steers the current through the load.

4,163,189

TRANSFORMER WITH A FERROMAGNETIC CORE FOR D-C AND A-C SIGNALS

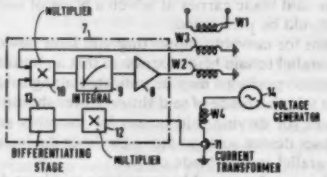
Kurt Smutny, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 802,036

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625354

Int. Cl.² H01F *21/08*

U.S. Cl. 323—6 **15 Claims**



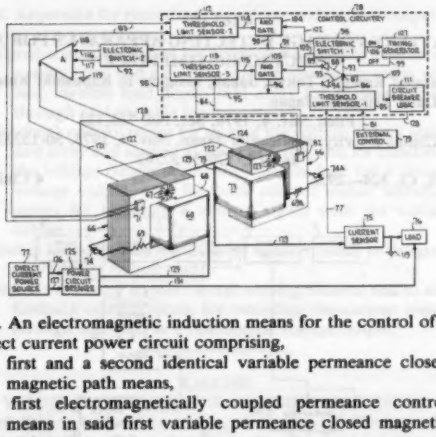
1. A transformer for d-c and a-c signals comprising:

(a) a ferromagnetic core capable of having therein two independent magnetic fluxes;
(b) a primary winding wound on said core;
(c) a secondary winding wound on said core;
(d) a supplemental winding, wound on said core, for changing the permeability of said core;
(e) means for supplying a periodically changing current coupled to said supplemental winding to produce a secondary magnetic flux in said core which is independent of the magnetic flux of said primary and said secondary windings;
(f) means for measuring the change in the magnetic characteristics in said core; and
(g) means responsive to said means for measuring to supply a d-c current to said secondary winding, which current acts to cancel the effect of the permeability change on said means for measuring to thereby force equalization of the magnetization in said primary and said secondary windings.

4,163,190
APPARATUS FOR CONTROL OF ELECTRICAL CURRENT BY ELECTROMAGNETIC INDUCTION

Nathan A. Moerman, 7310 Maple Ave., Chevy Chase, Md. 20015

Division of Ser. No. 762,896, Jan. 26, 1977, Pat. No. 4,112,347, which is a division of Ser. No. 635,007, Nov. 25, 1975, Pat. No. 4,020,440. This application Nov. 7, 1977, Ser. No. 849,149
Int. Cl.[2] G05F *1/04, 7/00*
U.S. Cl. 323—6 **4 Claims**



4. An electromagnetic induction means for the control of a direct current power circuit comprising,
a first and a second identical variable permeance closed magnetic path means,
a first electromagnetically coupled permeance control means in said first variable permeance closed magnetic path means,
a second electromagnetically coupled permeance control means in said second variable permeance closed magnetic path means,
a first load current winding surrounding said first variable permeance closed magnetic path means,
a second load current winding surounding said first variable permeance closed magnetic path means,
a second load current winding surrounding said second variable permeance closed magnetic path means,
a direct current circuit breaker means including a magnetic transformer means,
a current sensing means,
a load terminal means,
means for serially connecting said direct current circuit breaker means, said first load current windig, said second load current winding, said current sensing means and said load terminal means,
a first reverse transient suppression means having a third winding means surrounding said first variable permeance closed magnetic path, a first unidirectional current flow and electrical energy absorbing means,
means for serially connecting said third winding means, said first unidirectional current flow and electrical energy absorbing means,
a second reverse transient suppression means having a fourth winding means surrounding said second variable permeance closed magnetic path, a second unidirectional current flow and electrical energy absorbing means,
means for serially connecting said fourth winding means, said second unidirectional current flow and electrical energy absorbing means,
a load current sensing voltage feedback means,
a threshold load current limit sensor means,
means connecting said feedback means between said current sensing means and said threshold load current limit sensor means,
a first and a second electronic switch means, each having a first and a second input means and a first and a second output means, said first electronic switch also having a timing pulse output means,
a direct current circuit breaker decision circuit means,
a timing generator means,
a first and a second diode means,
a means connecting the output of said threshold load current limit sensor means to the anode of each of said diode means, to said first input of said first electronic switch means and to said decision circuit means,
a means connecting the output of said decision circuit means to said cirect current circuit breaker means,
a means connecting said timing pulse output means to said timing generator means,
a means connecting the output of said timing generator means to the second of said input means to said first electronic switch,
a first and a second flux density sensor means,
a first and a second threshold voltage level detector and signal generating means,
means coupling said first flux density sensor means to said first variable permeance closed magnetic path means,
means coupling said second flux density sensor means to said second variable permeance closed magnetic path means,
means connecting the output of said first flux density sensor means to said first threshold voltage level detector means,
means connecting the output of said second flux density sensor means to said second threshold voltage level detector means,
a first and a second logic AND gating means,
a first and a second trigger connecting means,
a means connecting the output of said first threshold voltage level detector means as one of the inputs to said first logic AND gating means,
a means connecting the output of said second threshold voltage level detector means as one of the inputs to said second logic AND gating means,
a means connecting the first output of said first electronic switch means as the second input to said first logic AND gating means,
a means connecting the second output of said first electronic switch means as the second input to said second logic AND gating means,
said first trigger connecting means connected to the cathode of said first diode means, to the output of said first logic AND gating means, and to the first input of said second electronic switch means,
said second trigger connecting means connected to the cathode of said second diode means, to the output of said second logic AND gating means, and to the second input of said second electronic switch means,
a commutation amplifier means,
a means connecting said first output of said second electronic switch means as the first input of said commutation amplifier means,
a means connecting said second output of said second elec-

tronic switch means as the second input of said commutation amplifier means,

the switching output means of said commutation amplifier means connected as the input means for said first and second variable permeance control means,

the output of said commutation amplifier means switched between the inputs of said first and second electromagnetically coupled variable permeance control means to effect a minimum permeance state in one and a maximum permeance state in the other of said first and second variable permeance control magnetic paths and produce thereby on continued switching of said commutation amplifier an average counter electromotive force to reduce the said load current to a controlled operating limit,

an override control means to provide external actuating means,

means connecting said override control means to said threshold load current limit sensor means,

said threshold load current limit sensor means providing an output of control signals upon the occurrence of a current level above the level established within said threshold load current limit sensor,

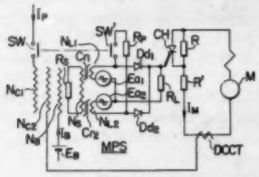
upon the receipt of a predetermined number of said control signals, said direct current circuit breaker decision circuit means produces an output signal to provide said magnetic transformer means therein momentary load current suppression means coincident with the operation of said direct current circuit breaker means.

4,163,191

MAGNETIC PHASE SHIFTER CONTROL SYSTEM

Hisakatsu Kiwaki; Hiroshi Narita, and Hiroshi Sato, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 16, 1977, Ser. No. 825,042
Claims priority, application Japan, Sep. 3, 1976, 51-104896
Int. Cl.[2] H02P *5/16, 5/18*
U.S. Cl. 323—89 M **17 Claims**



1. A magnetic phase shifter control system comprising a magnetic phase shifter with a predetermined amplification degree, said magnetic phase shifter including a saturable core, an output winding coupled magnetically to said saturable core for producing an output signal in accordance with said amplification degree, and an A.C. power supply for exciting said output winding, a first means for suppressing the output signal of said magnetic phase shifter to a level lower than a predetermined level, and a second means for changing the amplification degree of said magnetic phase shifter when said first means is operative.

4,163,192

IGNITION SPARK ZONE DURATION CIRCUIT

Eldon M. Sutphin, Jr., Merrimack, N.H., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,704
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—15 **6 Claims**

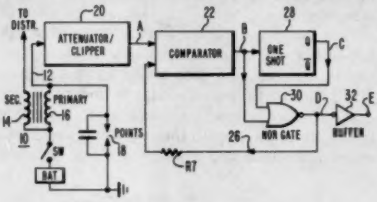
4. Means for generating an electrical pulse having a duration equal to the spark zone duration in an internal combustion engine, comprising

a comparator having a signal input coupled to the primary winding of the ignition coil of the engine, and having a reference signal input,

a monostable multivibrator having a trigger input coupled to the output of the comparator, and

an "or" gate coupling the output of the comparator and the output of the multivibrator to the reference signal input of the comparator,

whereby the output of said "or" gate is a clean square pulse having a duration equal to the spark zone duration.



5. In combination,

a comparator having a signal input, a reference input, and an output,

a monostable multivibrator having a trigger input coupled to the output of the comparator, and

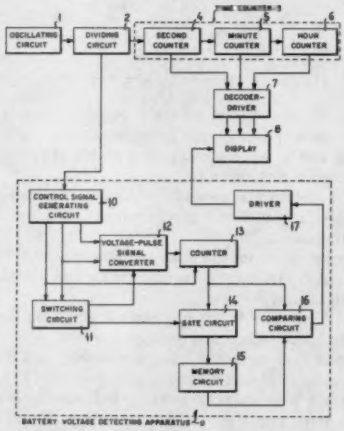
an "or" gate coupling the output of the comparator and the output of the multivibrator to the reference input of the comparator.

4,163,193

BATTERY VOLTAGE DETECTING APPARATUS FOR AN ELECTRONIC TIMEPIECE

Masaaki Kamiya, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 4, 1976, Ser. No. 738,722
Claims priority, application Japan, Nov. 4, 1975, 50-132338
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 **4 Claims**



1. In a battery powered electronic timepiece, a low battery voltage detecting circuit comprising: memory means for storing a reference digital voltage signal defining a digital value of a reference voltage level of a battery which powers the electronic timepiece; battery voltage measuring means for digitally measuring battery voltage and for developing a digital voltage output signal representative of the measured battery voltage; and a digital comparator circuit connected to receive the

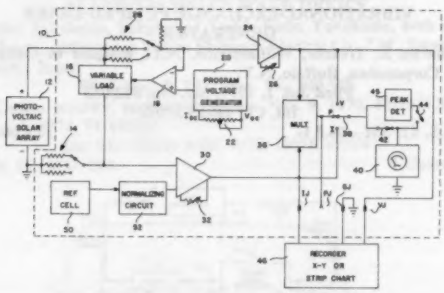
stored reference digital voltage signal and the digital voltage signal representing battery voltage for comparing the same and for developing an output signal when the digital voltage signal representing battery voltage coincides with reference digital voltage signal.

4,163,194

VOLTAGE-CURRENT-POWER METER FOR PHOTOVOLTAIC SOLAR ARRAYS

Ronald G. Ross, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jul. 22, 1977, Ser. No. 818,122
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 **12 Claims**



1. Apparatus for recording the voltage and current output of a solar array comprising

signal-controlled means for producing a variable load across a solar array and a current-sensing element in series with said variable load across said array for sensing current through said variable load,

feedback control means for sensing the voltage output across said array and sensing element in series, and for stabilizing the voltage output across the variable load for a desired voltage output, said feedback control means including means for summing a control signal with the voltage output,

means for generating said control signal, thereby to program said voltage output, and

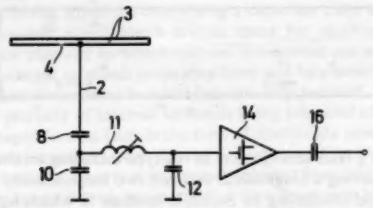
means connected to said current sensing element and to said feedback control means for recording the current sensed through said load as a function of voltage output.

4,163,195

VEHICLE ANTENNA AND WINDOW AMPLIFIER

Gerd Sauer, Aachen-Laurensberg, Fed. Rep. of Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Sep. 1, 1977, Ser. No. 829,779
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639947
Int. Cl.[2] H04B *1/18*; H01Q *1/32*
U.S. Cl. 325—313 **23 Claims**



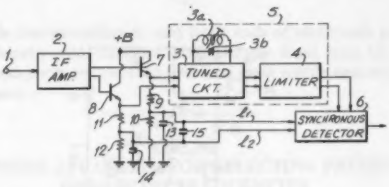
23. An antenna conductor located on or in a windshield, said conductor comprising a vertical element having a electrical path length that is equal to or greater than a quarter wave length and a horizontal element shaped in the form of a loop and connected at one point to said vertical element, said horizontal element comprising a pair of substantially parallel horizontal conductors extending along the upper edge of the windshield and joined together at their extremities, said loop having a break which makes the antenna conductor electrically asymmetrical.

4,163,196

DEMODULATING APPARATUS WITH PHASE SHIFT COMPENSATION

Masayuki Hongu, Kawasaki; Masaharu Tokuhara; Yoshihiro Yamamoto, both of Tokyo, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,279
Claims priority, application Japan, Apr. 4, 1977, 52-38406
Int. Cl.[2] H03D *1/06, 3/18*
U.S. Cl. 329—50 **11 Claims**



1. Demodulating apparatus comprising means for supplying a modulated signal; carrier deriving means coupled to said means for supplying the modulated signal for deriving an unmodulated carrier signal from said modulated signal, said carrier deriving means including a tuned circuit having a center frequency substantially coincident with the carrier frequency of said modulated signal and a limiter circuit coupled to said tuned circuit for eliminating amplitude fluctuations in the signal supplied thereto by said tuned circuit, said limiter circuit imparting a phase shift to said signal supplied thereto in connection with its elimination of said amplitude fluctuations; synchronous detecting means coupled to said means for supplying the modulated signal and to said carrier deriving means for detecting the modulated signal with said derived carrier signal; and phase shift means connected between said means for supplying and said synchronous detecting means for imparting a phase shift to said modulated signal which substantially compensates for said phase shift imparted by said limiter circuit in said carrier deriving means, whereby the amplitude modulated signal and the carrier applied to said synchronous detecting means are substantially in phase with each other.

4,163,197

AUDIO-FREQUENCY POWER AMPLIFIER

Tohru Sampei, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 16, 1978, Ser. No. 878,401
Claims priority, application Japan, Feb. 16, 1977, 52-15003
Int. Cl.[2] H03F *3/18*
U.S. Cl. 330—263 **14 Claims**

1. An audio-frequency power amplifier comprising:

a preamplifier stage having an input terminal and an output terminal;

a push-pull amplifier stage having an input terminal and an output terminal;

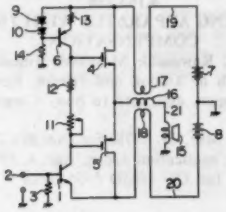
input means supplying an audio-frequency signal to said input terminal of said preamplifier stage;

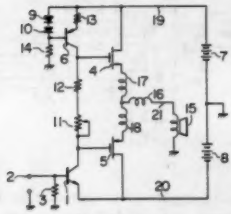
means connected between said output terminal of said preamplifier stage and said input terminal of said power

amplifier stage for supplying the output signal of said preamplifier stage to said power amplifier stage;

a load circuit connected with said output terminal of said power amplifier stage to receive the output signal of said power amplifier stage whereby a signal path for the audio-frequency signal is established between the input means supplying the audio-frequency signal and the load circuit through the push-pull power amplifier;

DC power source means for supplying power via a current path to said preamplifier stage and said power amplifier stage; and





magnetic coupling means comprising a first coupling coil connected in series with the signal path of said audio-frequency signal and a second coupling coil connected in series with the current path of current supplied from said DC power source means for supplying the harmonic components of current flowing through said current path to said signal path with the phase and the signal level which cancel the harmonic components of current included in said output signal supplied to said load circuit.

4,163,198

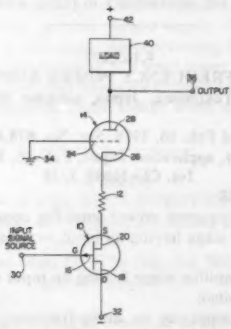
AUDIO AMPLIFIER

David W. Berning, 11007 Candlelight La., Potomac, Md. 20854

Filed Dec. 8, 1977, Ser. No. 858,649

Int. Cl.[2] H03F *3/16*

U.S. Cl. 330—277 **6 Claims**



1. An amplifier circuit comprising:

a vacuum tube having a cathode, a plate, and at least one grid located between said cathode and said plate, said grid connected to a ground potential;

load means connected between said plate and a source of positive voltage;

means for extracting an output signal developed across said load means;

a P-channel field effect transistor having a source electrode, a drain, and at least one gate;

said drain connected to a source of negative voltage;

circuit means for connecting said cathode and said source electrode; and

said gate adapted to be connected to an input signal source.

4,163,199

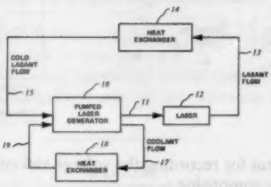
THERMAL-RADIATION EXCITED VIBRATIONAL-EXCHANGE PUMPED LASER GENERATOR

Charles E. Treanor, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,033

Int. Cl.[2] H01S *3/091*

U.S. Cl. 331—94.5 G **13 Claims**



1. A method for optically pumping a laser from an incoherent radiation source including the steps of:

passing a lasant gas through a laser generator;

supplying incoherent radiation containing the correct wavelengths for absorption by the lasant gas into the laser generator;

filtering the incoherent radiation supplied into the laser generator to reject wavelengths unsuitable for vibrational absorption whereby only correct wavelengths reach the lasant gas which is then excited by vibration-vibration exchange while remaining otherwise cool; and

passing the excited lasant gas to a laser cavity where the excited lasant gas relaxes to produce lasing.

4,163,200

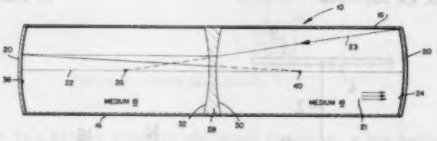
LASER BEAM ARRANGEMENT

John M. DeMaggio, 117-14 125th St., S. Ozone Park, N.Y. 11420

Filed Jul. 11, 1977, Ser. No. 814,672

Int. Cl.[2] H01S *3/08*

U.S. Cl. 331—94.5 C **4 Claims**



1. In a laser arrangement of the type including an elongated body having a longitudinal axis and two longitudinally spaced ends and containing an excitable medium in which light rays substantially parallel to the longitudinal axis are excited during the operation of the arrangement, reflected from two mirrors each arranged at one of the ends of the body, and eventually

emitted through one of the ends of the body in the form of a laser beam, the improvement wherein each of the mirrors is concave and reflects all those light rays, which impinge upon the same in parallelism with the longitudinal axis, toward a focusing location situated in a focal plane passing through the longitudinal axis and spaced from the associated mirror more than a half of the distance between the mirrors; and further comprising a diverging lens positioned intermediate said focusing locations of the two mirrors and so configurated as to refract those light rays, which have been reflected from the mirrors toward the respective focusing locations, into a substantial parallelism with the longitudinal axis and closer to said focusing locations than the originally excited light rays.

4,163,201

ELASTIC SURFACE WAVE DEVICE

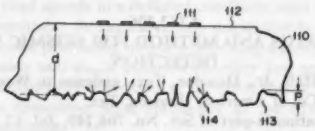
Sadao Takahashi, Tokyo, and Toshio Sudo, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 9, 1977, Ser. No. 849,945

Claims priority, application Japan, Nov. 9, 1976, 51-133720; Nov. 9, 1976, 51-133721

Int. Cl.[2] H03H *9/26, 9/32;* H01L *41/18*

U.S. Cl. 333—194 **4 Claims**



1. An elastic surface wave device comprising an X-cut $LiTaO_3$ piezoelectric substrate whose thickness d satisfies the following expression

$$\frac{2.13n}{f_l} < d < \frac{2.13(n+2)}{f_u}$$

where

n: an odd number of 1, 3, 5, 7 . . .

f_l: a minimum frequency (MHz) of a filter pass band

f_u: a maximum frequency (MHz) of a filter pass band

d: a thickness (mm) of the $LiTaO_3$ substrate and transducers formed on one surface of the substrate.

4,163,202

TUNING APPARATUS AND METHOD OF PRODUCING THE SAME

Toyoaki Tunematu, Kanzaki; Seiichi Takeno, and Testuo Yamaguchi, both of Youkaichi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 4, 1978, Ser. No. 893,394

Claims priority, application Japan, Apr. 15, 1977, 52-48167[U]

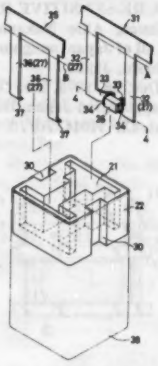
Int. Cl.[2] H03J *3/20*

U.S. Cl. 334—76 **16 Claims**

1. A tuning apparatus comprising a capacitor chip, a coil, a base member which has a hollow space for receiving said capacitor chip and on which said coil is mounted, and a plurality of external terminals projecting from said base member and electrically connected to said capacitor chip and coil,

said plurality of external terminals being prepared of comb-shaped formed parts in the form of electrically conductive metal members each having a plurality of comb teeth, wherein at least two comb teeth selected from said plurality of comb teeth are inserted at their front ends into said hollow space of said base member and fixed in position by resin poured into said hollow space, the roots of said comb teeth being then severed to separate said comb teeth from each other, thereby providing at least two independent external terminals,

said capacitor chip having its two terminals directly connected to the portions of said at least two external terminals corresponding to said front ends of said comb teeth, whereby said capacitor chip and the front ends of said comb teeth are covered with said resin within said hollow space.



4,163,203

TUNING APPARATUS FOR SELECTING PRESET BROADCAST FREQUENCIES

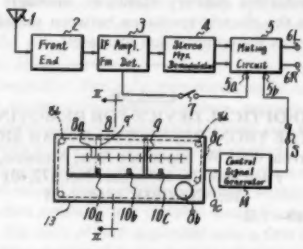
Kokichi Morii, Chigasaki, and Kohei Haneishi, Musashino, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 890,916

Claims priority, application Japan, Mar. 30, 1977, 52-35979; Apr. 5, 1977, 52-38740

Int. Cl.[2] H03J *1/02, 3/12, 1/04*

U.S. Cl. 334—86 **8 Claims**



1. A tuning apparatus for a broadcast receiver comprising a dial scale representing broadcast frequencies over a predetermined frequency band, a dial indicator movable along said dial scale for indicating the broadcast frequency to which the apparatus is tuned, sensor means coupled with said indicator for movement therewith in respect to said dial scale, said sensor means including photo-sensitive means and a light source for directing light upon said photo-sensitive means across a gap therebetween, presetting means positionable along said dial scale from outside the dial scale for selecting at least one broadcast frequency to be received and having shutter means which extends into said gap of said sensor means when said indicator is disposed to indicate the broadcast frequency selected by said presetting means, whereby to block the impingement of light on said photo-sensitive means from said light source, control signal generating means connected with said photo-sensitive means for producing a muting control signal in response to the extending of said shutter means of said presetting means into said gap of said sensor means, and circuit means responsive to said muting control signal to mute the

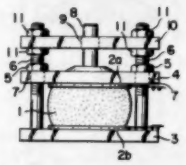
transmission of a signal by said tuning apparatus in the absence of said muting control signal.

4,163,204

PRESSURE-SENSITIVE RESISTORS

Ryoichi Sado, Saitama; Akio Nakamura, Toda, and Naoki Kodama, Omiya, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Ninonbashi, Japan

Filed Dec. 26, 1978, Ser. No. 973,088
Claims priority, application Japan, Dec. 30, 1977, 51-160713
Int. Cl.[2] H01C *10/10, 10/12*
U.S. Cl. 338—114 **2 Claims**



1. A pressure-sensitive variable resistor comprising (a) an electroconductive rubbery elastomer member composed of an electically insulating rubbery elastomer as a matrix and an electroconductive powder uniformly dispersed in the matrix,

(b) a pair of electrodes provided in contact with the opposite surfaces of the electroconductive rubbery elastomer member,

(c) a means for giving a compressive force between the electrodes sufficient to keep the electroconductive rubbery elastomer member under compression to an extent exceeding the value with which the electric resistance between the electrodes is minimal and beyond which the electric resistance between the electrodes increases as the compression increases, and

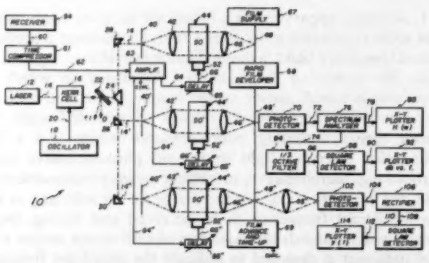
(d) a means for adjusting the compression given to the electroconductive rubbery elastomer member in a region where the electric resistance between the electrodes increases as the compression increases.

4,163,205

ACOUSTO-OPTICAL DEVICE FOR REMOVING BUBBLE PULSE FROM REFLECTED SONAR SIGNAL

Daniel Barron, 6001 W. Esplanade Ave., Metairie, La. 70003

Filed Jan. 26, 1978, Ser. No. 872,401
Int. Cl.[2] G01V *1/38, 1/28*
U.S. Cl. 340—7 R **12 Claims**



1. Apparatus for processing first electrical signals representative of incident and reflected acoustic signals generated by an underwater explosion and characterized by unwanted incident and reflected signals as well as incident signals of interest x(t) and reflected signals of interest y(t), said apparatus comprising:

a source of coherent light;

shutter means for modulating said light by interruption and passing thereof at a predetermined strobe frequency;

means for directing said light modulated by said shutter in a predetermined path;

acousto-optical modulator means, responsive to said electrical signals, for diffracting said light in said path in accordance with said acoustic signals;

lens means for focusing said diffracted light at a predetermined focal plane;

direct positive photographic film means disposed at said focal plane for producing on said film means a positive photographic image of a diffraction interference pattern corresponding to the inverse Fourier transform 1/X(w) of a predetermined incident signal of interest;

whereby said film means forms a filter such that, when directly illuminated by light diffracted by said acousto-optical modulator means in accordance with said reflected signals so as to form a diffraction interference pattern at said focal plane corresponding to the Fourier transform Y(w) of said reflected signals of interest, light is passed by said filter in accordance with Y(w)/X(w);

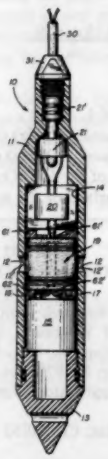
whereas light forming diffraction interference patterns at said focal plane corresponding to Fourier transforms of said unwanted signals is blocked by said filter.

4,163,206

APPARATUS AND METHOD FOR SEISMIC WAVE DETECTION

Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 704,149, Jul. 12, 1976, abandoned, and Ser. No. 679,416, Apr. 22, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,704
Int. Cl.[2] G01V *1/16;* **H04R** *15/00, 17/00*
U.S. Cl. 340—17 R **3 Claims**



1. A seismic sensor comprising in combination:

a rigid housing;

a pressure sensor, encased in a module that is removably mounted in the housing, for generating a first signal proportional to pressure applied to the sensor;

a separate acceleration sensor, encased in a module that is removably mounted beneath said pressure sensor module in the housing, for generating a second signal proportional to acceleration forces applied to the housing; and

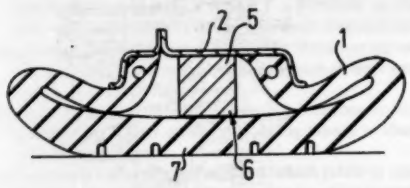
means for electrically connecting said pressure sensor in series directly with said accelerometer sensor to produce a third sum signal.

4,163,207

TIRE DEFLATION WARNING DEVICE

Alan M. Dodd, Walsall, England, assignor to Dunlop Limited, England

Filed Jun. 2, 1976, Ser. No. 692,190
Claims priority, application United Kingdom, Jun. 4, 1975, 24046/75
Int. Cl.[2] B60C *17/00*
U.S. Cl. 340—58 6 Claims



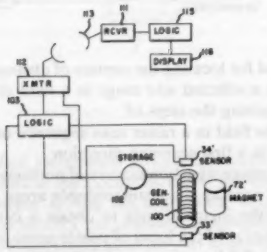
1. A tire deflation warning device for a road vehicle comprising noise producing means on a single inflation chamber tire and wheel assembly to produce disturbing noise frequencies in the range of 80 to 280 Hz only when the tire is running at normal road speeds in a deflated condition, said frequencies being transmittable through a vehicle suspension to the vehicle body, the noise producing means comprising a noisy formation situated inside said single inflation chamber and positioned to contact the assembly other than at the noisy formation itself to generate a disturbing noise frequency as the tire runs in a deflated condition.

4,163,208

AUTOMATIC WIRELESS TIRE PRESSURE MONITORING SYSTEM

Ernest J. Merz, 745 Old State Rd., Berwyn, Pa. 19312

Continuation-in-part of Ser. No. 641,817, Dec. 18, 1975. This application Aug. 16, 1977, Ser. No. 825,177
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 14 Claims



1. An automatic vehicle tire pressure monitoring system comprising:

a pressure sensitive actuator mounted on the wheel of said vehicle;

means for generating a magnetic field mounted on said wheel and adjustable by said pressure sensitive actuator when the pressure in said vehicle tire changes;

an electromagnetic coil located on the chassis of said vehicle so that an electromagnetic potential is generated within the coil by said magnetic field;

a transmitter connected to said electromagnetic coil, said transmitter receiving its power from said electromagnetic coil; and

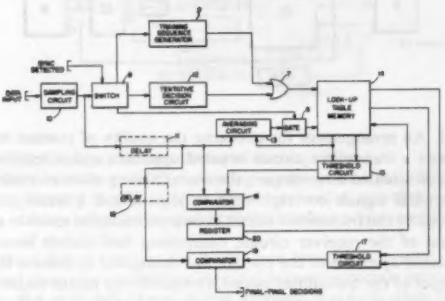
magnetic field sensors on the chassis of said vehicle, said sensors being responsive to said magnetic field and connected to said transmitter so that said transmitter transmits signals representing tire pressure.

4,163,209

TECHNIQUE FOR CONTROLLING MEMORYFUL NON-LINEARITIES

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 28, 1977, Ser. No. 837,443
Int. Cl.[2] G08C *25/00*
U.S. Cl. 340—146.1 E 29 Claims



1. In a data communications system for processing received data transmitted through a data transmission path containing memoryful non-linearities, wherein received data to be processed is sampled, to provide sequential values representative of transmitted data symbols, a method for combatting the effects of said memoryful non-linearities in said transmitted data comprising the steps of:

storing, in a memory, a plurality of data symbol set values representative of the average effects imparted by the memoryful non-linearity-containing transmission path on pluralities of each of the respective sets of data symbols of which transmitted data to be processed may be comprised;

converting sequentially sampled values representative of received data symbols transmitted through said data transmission path into a first series of data symbols;

successively addressing said memory in accordance with the sequential sets of data symbols contained within said first series of data symbols, and thereby reading out from said memory, for each of said sequential sets, a first data symbol set value contained in the memory location identified by said each of said sequential sets, and a second data symbol set value contained in a memory location identified by another data symbol set which differs from said each symbol set by one of the symbols therein;

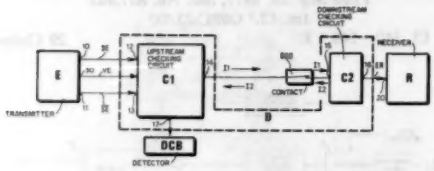
comparing a respective sequentially sampled value representative of a received data symbol, the location of which received data symbol coincides with the location of said one of said symbols in said each of said sequential sets, with a threshold value defined in accordance with said first and second data symbol set values; and

decoding said respective sequentially sampled value as the symbol contained in said location of either said first data symbol set or said second data symbol set, in accordance with whether or not said sequentially sampled value exceeds said threshold value, whereby, for said sequentially sampled values of received data symbols there is obtained a decoded series of data symbols corresponding to the data symbols transmitted through said data transmission path.

4,163,210
ARRANGEMENT FOR CHECKING A CONTACT INSERTED BETWEEN A TRANSMITTER CIRCUIT AND A RECEIVER CIRCUIT TO ALLOW ELECTRICAL SIGNALS TO BE TRANSMITTED

Georges M. Giraud, Le Vesinet, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 6, 1978, Ser. No. 875,564
Claims priority, application France, Feb. 7, 1977, 77 03317
Int. Cl.[2] G06F *11/00*; G08B *29/00*; H04L *25/02*
U.S. Cl. 340—146.1 E 5 Claims



1. An arrangement for checking the quality of contact between a transmitter circuit situated upstream and a receiver circuit situated downstream, the contact being made to enable electrical signals corresponding to logic 1 and 0 states produced by the transmitter circuit to be transmitted in series to an input of the receiver circuit, comprising first circuit means situated upstream of the contact and connected to receive the output of the transmitter circuit, second circuit means situated downstream of the contact and connected to the input of the receiver circuit, the first circuit means being adapted to produce, at a first output, a continuous current in a predetermined direction or the opposite direction in the presence of a transmitter signal at the transmitter output representing a logic 1 or 0 state, the second circuit being adapted to generate, at an output connected to the input of the receiver circuit, a signal corresponding to the logic state generated by the transmitter circuit when said continuous current in the corresponding direction is emitted by the first circuit, the first circuit being adapted to emit a signal at a second output when the said continuous current is present for indicating that the contact is satisfactory.

4,163,211
TREE-TYPE COMBINATORIAL LOGIC CIRCUIT

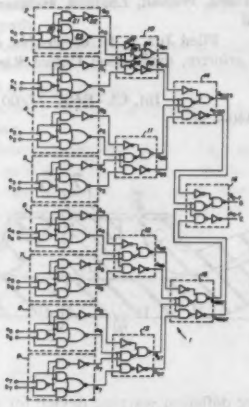
Kenichi Miura, Saratoga, Calif., assignor to Fujitsu Limited, Japan

Filed Apr. 17, 1978, Ser. No. 897,132
Int. Cl.[2] G06F *7/02, 7/50, 11/10*
U.S. Cl. 340—146.2 13 Claims

1. A tree-type logic circuit comprising:

a plurality of cascading circuits, each of said cascading circuits having four input terminals, two output terminals and an internal logic circuit, each of said cascading circuits being connected in multi-stages to form a tree, said internal logic circuit having means for generating signals of Boolean function $G_{K*l}=G_K VE_K g_l$ and $E_{K*l}=E_K e_l$ wherein G_K is a signal applied to the first terminal of said four input terminals, E_K is a signal applied to the second terminal of said four input terminals, g_l (g_{K+1}) is a signal applied to the third terminal of said four input terminals and e_l (e_{K+1}) is a signal applied to the fourth terminal of said four input terminals; where K and l are either an integer between 0 and N-1 or any concatination thereof, and "N" is the total number of input signal paths, "*" means concatination operator for two integers;

first signal generating means for applying first N binary bit input signals g_0 to g_{N-1} to said first and third terminals of each of said cascading circuits in the first stage, consecutively; and

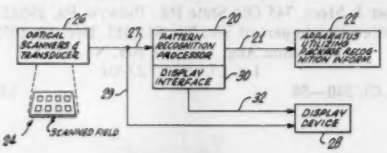


second signal generating means for applying second N input signals e_0 to e_{N-1} to said second and fourth terminals of said cascading circuits in the first stage consecutively.

4,163,212
PATTERN RECOGNITION SYSTEM

Walter R. Buerger, Torrance; Kenneth K. Dixon, San Pedro, and Jacques F. Monier, Torrance, all of Calif., assignors to Excellon Industries, Torrance, Calif.

Filed Sep. 8, 1977, Ser. No. 831,667
Int. Cl.[2] G06K *9/04*
U.S. Cl. 340—146.3 H 33 Claims



1. A method for locating the centers of distinguishable areas falling within a selected size range in a field of interest, said method comprising the steps of:

scanning the field in a raster scan sequence of parallel lines oriented in a first scanning direction;

generating image signals indicative of portions of the parallel lines that overlap the distinguishable areas; and

processing the image signals to obtain a centerline signal representative of the locus of center points of the portions of the parallel lines that overlap the distinguishable areas, said processing step also including disregarding image signals indicative of distinguishable areas falling outside a selected size range.

4,163,213
ALPHANUMERIC CHARACTER IDENTIFICATION

Morton Nadler, Le Celle Saint-Cloud, France, assignor to Norprint Limited, England

Filed Nov. 2, 1977, Ser. No. 847,894
Claims priority, application United Kingdom, Nov. 4, 1976, 45872/76
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 D 19 Claims

1. A method of character identification, comprising the steps of

forming on a predetermined area a representation of the character to be identified,

subjecting the area to a plurality of frame scans, the scans comprising at least three scans of respectively different directions,

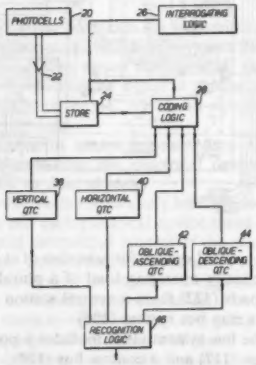
detecting during each scan whether or not each element of the said area includes part of the character representation,

producing in response to each said scan either no code or one or more of the following codes in dependence on the shape of the character representation, namely codes respectively representing a START, a FINISH, an OPENING and a CLOSING of the character representation,

monitoring the said codes to divide the character representation into segments thereof each of which at least partially embraces a concavity thereof,

storing those codes of each segment which relate to convexity-shapes in a part of storage means which is identified with that segment,

storing those codes of each segment which relate to concavity-shapes in a part of the storage means which is identified with that segment and is different from the said part which is identified with the same segment but is for storing those codes relating to convexity-shapes thereof,



initiating a first recognition process by comparing the relative positions in the storage means of the said parts of the storage means storing the said codes, whereby at least partially to identify the character representation,

initiating a second recognition process in dependence on the results of the first recognition process by comparing the identities of all the codes produced for the character representation with a predetermined set of groups of the codes, each group relating to a different one of a predetermined series of characters of predetermined shape and consisting of a list of the said codes corresponding to that character, whereby at least partially to identify the character representation;

storing the coordinate positions of the said codes in relation to a datum fixed relative to the said area, and

initiating a third recognition process in dependence on the results of the second recognition process by comparing the distance between selected pairs of the said codes by comparing the coordinates of the pairs of codes, whereby at least partially to identify the said character representation.

4,163,214

CHARACTER RECOGNITION SYSTEM

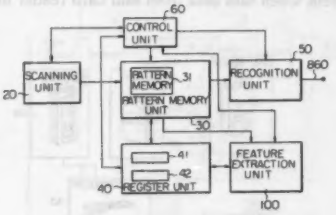
Kazuaki Komori; Takahiko Kawatani, both of Yokosuka; Hiroshi Kaneko, Yokohama, and Kenichiro Ishii, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed May 2, 1978, Ser. No. 902,175

Claims priority, application Japan, Jul. 12, 1977, 52-83734

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **5 Claims**



1. A character recognition system comprising;

(a) means for optically scanning a pattern area including a plurality of cells each having a binary value, and obtaining binary information relating to the black or white condition of each cell,

(b) a digital memory for storing said binary information,

(c) means for performing an initial feature extraction process for each cell in said digital memory, in which when the cell is white, it is encoded according to the presence of a character line in a predetermined direction from said white cell, and when the cell is black it is encoded according to the binary value adjacent to the black cell,

(d) means for performing a unification process for each cell in said digital memory, in which the code of each cell is compared with the code of an adjacent cell using a past register and a present register for storing the codes, and substituting the code in one register for the code in the other register,

(e) means for performing a concentration process for each cell in said digital memory after said unification process, said concentration process being, when the cell is black, the code of the first white cell in a predetermined direction from the black cell is attached to the code of the black cell, and when the cell is white, the code of the first white cell beyond the character line in a predetermined direction from the white cell is attached to the code of the white cell, and

(f) means for performing a recognition process after the concentration process, the recognition process comprising the steps of scanning the concentrated code of each cell in the digital memory, counting a predetermined concentrated code on a predetermined sequence and condition, determining whether the counted value is in a predetermined range, and determining the character to be recognized.

4,163,215

SAFETY LOCK SYSTEM FOR CONTROLLING ACCESS TO AN AREA IN RESPONSE TO PREDETERMINED DATA INPUTS

Makoto Iida, Tokyo, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 810,759

Claims priority, application Japan, Jun. 30, 1976, 51-78406

Int. Cl.[2] H04Q *9/00*

U.S. Cl. 340—149 A **22 Claims**

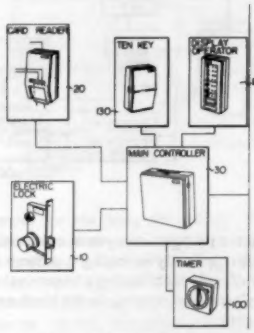
1. A safety lock system comprising:

(a) lock means mounted on a gateway to an area for controlling access to the area,

(b) a main controller means connected to said lock means for controlling the locking and unlocking of said lock means said main controller means including a comparator means said lock means transmitting to said main controller means a normal operation signal upon completion of said locking or unlocking;

(c) card reader means coupled to said main controller means for reading the data on a card and transmitting said data to said comparator of said main controller means wherein said data is compared to predetermined data; and

(d) display means coupled to said main controller means wherein when said data from said card reader means is in



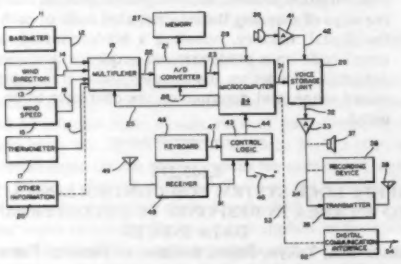
agreement with said predetermined data, said main controller means transmits a locking or unlocking drive signal to said lock means, and when said data from said card reader is not in agreement with said predetermined data, said main controller means transmits a first alarm signal to said display means, and wherein when said main controller means receives a normal operation signal from said lock means, said main controller means transmits a confirmation signal to said display means, and when said main controller means does not receive a normal operation signal from said lock means, said main controller means transmits a second alarm signal to said display means.

4,163,216

SYSTEM FOR TRANSMITTING AIRPORT WEATHER INFORMATION

Roberto Arpino, 4722 Shire Ridge Rd. W., Columbus, Ohio 43220

Filed Aug. 29, 1977, Ser. No. 828,304
Int. Cl.[2] G01C *21/00*; H04Q *9/00*
U.S. Cl. 340—152 R **16 Claims**



1. A system for transmitting realtime weather and other pertinent information to an airplane having a radio receiver comprising:

a source of a signal representing instantaneous weather information;

means responsive to said weather information signal over a predetermined time interval for determining a real-time weather information value and for generating an address signal representing said real-time weather information value;

means for storing a plurality of signals representing real-time weather information messages, said storage means being responsive to said address signal for generating the one of said plurality of message signals corresponding to said real-time weather information value; and

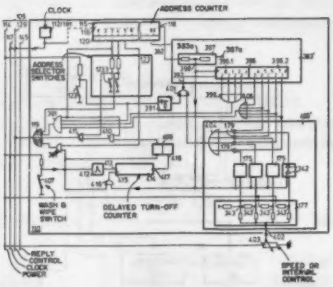
transmitting means responsive to said one message signal for transmitting said one message signal to the radio receiver whereby said real-time weather information message is audibly reproduced for the pilot.

4,163,217

REMOTE LOAD CONTROL SYSTEM

Jürgen Wesemeyer, Nüremberg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,323
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2654026
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 340—167 R **21 Claims**



1. Remote control system for selection of at least one periodically or cyclically operating load of a plurality of selectable switchable loads (122) from a central station (110) connected together by a ring bus system (106)

wherein the bus system (106) includes a power bus (114), a clock bus (117) and a control bus (129);

wherein the central station includes

a clock source (112),

load address means (123) including selector switches (123.1 . . .) to select connection of a selected load (122) to the power bus (114), and

means (115) providing control signals synchronized with clock pulses from the clock source for addressing loads in accordance with a selection of the load addressing means;

and wherein at least one of the loads is a periodically or cyclically operating load (122.1) requiring cyclical intermittent power from said power bus (114), said at least one load (122) including

a load control receiver,

and a decoding stage (130, 131, 135) forming part of said load control receiver (111) and being connected to both said clock bus (117) and said control bus (129) to decode address command signals on the control bus (129) appearing in synchronism with the clock pulse on the clock bus (117);

and wherein, in accordance with the invention,

the central station further includes cyclical pulse generation means (112, 382)

and coincidence means (381) having its input connected to both said cyclical pulse generation means and the specific selector switch (123.1, 123.1/2, 123') controlling said at least one periodically or cyclically operating load (122.1)

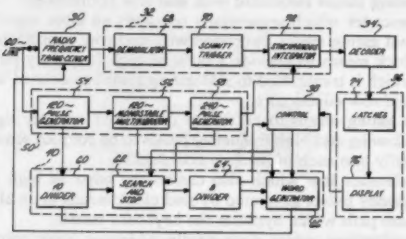
to control connection of said at least one cyclically operating load to the power bus in accordance with the pulses derived from said cyclical pulse generation means.

4,163,218

ELECTRONIC MULTIPLE DEVICE CONTROL SYSTEM

William I. L. Wu, 44 Little Fox La., Westport, Conn. 06880

Filed Sep. 13, 1976, Ser. No. 722,543
Int. Cl.[2] H04B *3/54*
U.S. Cl. 340—310 A **27 Claims**



1. An electronic control system for controlling the operation of a plurality of electrical devices which are energized from AC power lines, said control system comprising:

(a) a single central unit connected to the power lines and including:

(1) central transceiver means for transmitting an encoded oscillating signal of one frequency onto the power lines;

(2) central encoding means for encoding said oscillating signal with an encoded signal in synchronization with the frequency of the AC power for selective control of electrical devices;

(3) central control means connected to said encoding means for selecting the electrical device to be controlled and its desired state;

(b) unitary switch units respectively interconnected between power lines and each electrical device being operative for both local and centralized control of the electrical device with the local control and the centralized control placing the electrical device in respective opposite states from each other, each switch unit including:

(4) switch transceiver means for receiving the encoded oscillating signal from the power lines;

(5) switch decoding means coupled to the switch transceiver means for detecting the encoded signal;

(6) switch control means connected to said switch decoding means for setting the selected electrical devices to the desired state, and

(7) local control means for selectively locally operating the electrical device independently of the central unit and placing the electrical device in a state opposite from that which it was placed by the central unit.

4,163,219

REMOTE CONTROL DEVICE FOR ELECTRONIC APPARATUS

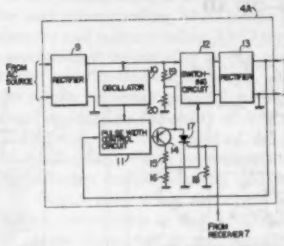
Takao Kato; Keizo Shimizu, and Takeshi Maruyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 19, 1978, Ser. No. 870,677
Claims priority, application Japan, Feb. 8, 1977, 52-12174; Mar. 9, 1977, 52-24812
Int. Cl.[2] H04Q *7/00*
U.S. Cl. 340—310 R **6 Claims**

1. A remote control device for the on-off control of power supply comprising:

a power supply voltage stabilizing circuit including a first rectifying circuit rectifying an ac voltage supplied from an ac power source to provide a non-stabilized dc voltage, a switching circuit chopping said dc voltage, an oscillating circuit generating a pulse signal for driving said switching circuit, a second rectifying circuit rectifying and smoothing said chopped dc voltage again to provide a dc output voltage, and a control circuit detecting a fluctuating component in said dc output voltage and controlling said switching circuit so as to remove the fluctuating component;

a load circuit supplied with said dc output voltage of said second rectifying circuit; and



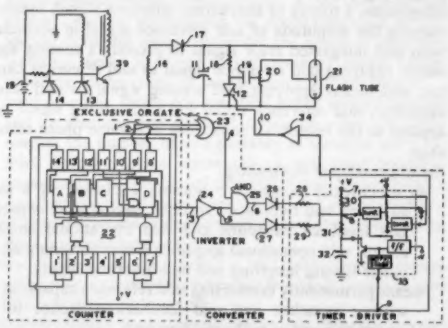
at least one electronic switch means actuated in response to the application of a remote control signal, said at least one electronic switch means being connected with at least one of said switching circuit, said second rectifying circuit, said oscillating circuit and said control circuit for disabling the circuit operation of said circuit.

4,163,220

DISTRESS SIGNALLING DEVICE

Lee A. Henningsen; John E. Hare, and David J. Amann, all of Erie, Pa., assignors to Firetrol, Inc., Erie, Pa.

Filed Apr. 15, 1977, Ser. No. 787,822
Int. Cl.[2] G08B *5/38*; H05B *41/24, 41/34*
U.S. Cl. 340—331 **6 Claims**



1. An apparatus for visual transmission of a coded S.O.S. distress signal through a high energy flash tube comprising:

a timer and driver circuit capable of producing a timed output signal in response to a charging signal applied to its input, said timer having its output coupled to the flash tube;

a binary coded decade counter having its input coupled to the output of said timer and driver circuit so as to advance the binary count;

converter means having its input coupled to the output of said decade counter and its output coupled to the input of said timer and driver circuit, said converter providing a parallel conductive charging path to said timer responsive to the binary output of the decade counter so as to lengthen or shorten the duration between the pulses produced at the output of said timer and driver circuit; and a

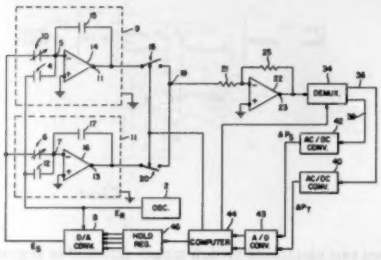
high energy flash tube circuit coupled to another output of said timer and driver circuit for energizing the flash tube.

4,163,221

CAPACITANCE TO DIGITAL CONVERSION SYSTEM

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 17, 1978, Ser. No. 896,951
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**



1. In a capacitance to digital conversion system wherein a digital representation is provided of the capacitance value of a condition sensing capacitor or the value of the stimulus to which said conditiion sensing capacitor is exposed, said system including said condition sensing capacitor, a reference capacitor, a feedback capacitor, operational amplifier means, means connecting said condition sensing capacitor and said reference capacitor as input impedances to said operational amplifier means, means connecting said feedback capacitor from the output to the input of said operational amplifier means in inverse feedback relationship, the output of said operational amplifier means constituting an error signal, means for converting said error signal to a digital error signal, means for integrating said digital error signal and storing the result of integration, a source of alternating reference signal, means for varying the amplitude of said reference signal in accordance with said integrated error signal to provide a sensing signal, means applying said reference signal to said reference capacitor, and means applying said sensing signal to said sensing capacitor, said reference signal and said sensing signal being applied to the respective capacitors in inverse phase relationship;

the improvement comprising:

an electrically conductive housing enclosing in a single structure said reference capacitor, said sensing capacitor, said feedback capacitor and said operational amplifier means, said operational amplifier means including an amplifier having inverting and non-inverting inputs;

means permanently connecting said reference capacitor, said sensing capacitor and said feedback capacitor to said inverting input of said amplifier; and

means connecting said housing and said non-inverting input of said amplifier to a point of common potential.

4,163,222

SYNCHRONOUS PHASE DETECTED KEYBOARD

Donald C. Gove, Manchester, Mass., assignor to Amkey, Incorporated, Andover, Mass.

Continuation of Ser. No. 662,195, Feb. 27, 1976, abandoned.
This application Sep. 29, 1977, Ser. No. 837,653
Int. Cl.[2] G06F *3/02*
U.S. Cl. 340—365 S **5 Claims**

1. In an electronic data processing entry-system, a synchronous phase detected keyboard, comprising in combination:

a printed circuit board whose conductors form a matrix of row coordinates and column coordinates, said row and column coordinates not physically intersecting because of discontinuities in said conductors at each possible intersection point of the matrix;

a plurality of key switch assemblies similarly arranged in a row and column matrix configuration and able to communicate with said printed circuit board, each of said key switch assemblies having an electrically-free floating key switch coupling plate to effect capacitive coupling between a row coordinate and a column coordinate of said printed circuit board at a corresponding possible intersection point of the matrix when said key switch assembly is actuated;

a gating means associated with said row coordinates;

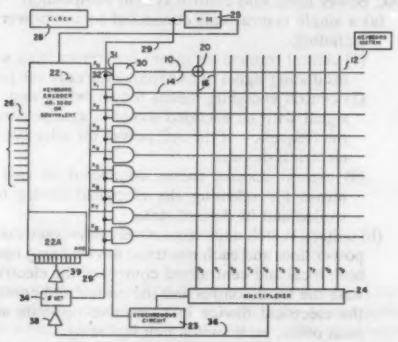
an encoder which sequentially transmits an input signal to said gating means associated with said row coordinates;

a clock means to provide a burst of high frequency pulses which is transmitted to said gating means associated with said row conductors;

said gating means to be turned on by said encoder signal allowing said high frequency pulses to be coupled sequentially into each of the row coordinates;

a reference line which also carries the burst of high frequency pulses generated by said clock means in an alternate path which bypasses the keyboard matrix;

a multiplexer which sequentially addresses each column coordinate of the matrix and receives said burst of high frequency pulses which has been coupled between a particular row coordinate and the column coordinate then



being addressed, due to actuation of the appropriate key switch assembly, said multiplexer then transferring the received burst through a single output channel;

a dividing counter means, driven by said clock means, which simultaneously drives said encoder and said multiplexer;

a single string data transference line which receives and carries the output signal from said multiplexer;

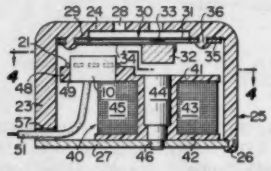
a current amplification means upon said single string data transference line to amplify the multiplexer output signal, a phase detection means upon said single string transference line having comparator terminals to receive from said reference line the high frequency pulses and to mix it with the amplified multiplexer output signal to distinguish false signals and generate a characteristic output voltage pulse at an amplitude proportional to the in-phase portion of the multiplexer output signal;

a thresholding amplifier which transmits and amplifies the characteristic voltage pulse generated by said phase detection means only if it exceeds a predetermined threshold, and a read only memory, integrated with said encoder which is driven by the dividing counter means and synchronized so as to be scanning in the same sequence and at the same rate as the multiplexer, and said memory receives and recognizes the amplified characteristic output voltage pulse from said phase detection means via the thresholding amplifier and generates a unique digital code which identifies to the data processing system the particular key switch assembly which has been actuated.

4,163,223
BUZZER WITH ELECTRONIC INTEGRATED OSCILLATION CIRCUIT

Yukio Sato; Mototaka Harakawa, and Yoshio Mitumori, all of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed Jan. 23, 1978, Ser. No. 871,403
Claims priority, application Japan, Jan. 21, 1977, 52-6501[U]
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 R 5 Claims

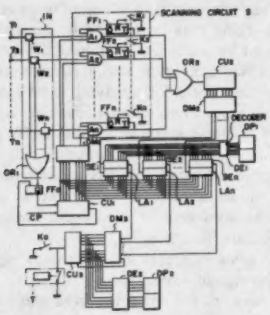


1. A buzzer comprising a vibration unit; an electromagnet transducer for electromagnetically exciting the vibration unit and including a core which is operatively disposed with respect to the vibration unit, a bobbin fitted on the core and a coil assembly disposed on the bobbin; and electrical components which cooperate with the coil assembly to form an electronic oscillation circuit, the electric components being formed on or in an integrated circuit module which includes terminals for connection of the oscillation circuit with the power source and other terminals for connection of the coil assembly with the oscillation circuit, the module being mounted on the bobbin.

4,163,224
DISPLAY DEVICE WITH MEMORY

Katsuya Yasuda, Yokohama, and Akio Adachi, Machida, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,338
Claims priority, application Japan, Feb. 27, 1976, 51-020951
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—520 1 Claim



1. A display device with a memory comprising:
- a plurality of terminal units, each for measuring a physical parameter and producing a signal when the physical parameter exceeds a predetermined limit;
- a first OR means connected to said plurality of terminal units for producing a signal when at least one of said terminal units produces a signal;
- a first counting means connected to said first OR means for initiating a counting operation at a predetermined rate when said first OR means produces a signal and for resetting said counting operation when the count reaches the number of said plurality of terminal units;
- a plurality of AND means, each having a first input connected to a corresponding one of said plurality of terminal units and second and third inputs, for producing an output when each of said first, second and third inputs receive a signal;
- a plurality of flip-flop circuits, each connected to a corresponding one of said plurality of AND means, for applying a signal to said second input of said corresponding AND means after being namually reset and for applying no signal to said second input of said corresponding AND means after said corresponding AND means produces an output, whereby said corresponding AND means is inhibited from producing an output after having once produced an output until said flip-flop circuit is manually reset;
- a first decoder means connected to said first counting means and said third inputs of said plurality of AND means, for applying a signal to said third input of the one of said plurality of AND means which corresponds to the count of said first counting means, whereby said AND means produces an output only when the count of said first counting means corresponds to said AND means;
- a second OR means connected to said plurality of AND means for producing a signal when one of said plurality of AND means produces a signal;
- a second counting means connected to said second OR means for counting the number of times said second OR means produces a signal;
- a plurality of memory means, each having a memory storage input means connected to said first counting means, a memory storage output means, a storage enable input and a recall enable input, for storing therein said count of said first counting means upon application of a signal to said storage enable input and for producing a signal corresponding to said number stored therein from said memory storage output means upon application of a signal to said recall enable input;
- a second decoder means connected to said second counting means and said plurality of memory means, for applying a signal to said storage enable input of the one of said plurality of memory means corresponding to the count of said second counting means upon the count operation of said second counting means, whereby the count of said first counting means is stored in said memory means corresponding to the count of said second counting means;
- a third counting means for counting under manual control and for resetting said counting operation when the count reaches the number of said plurality of terminal units;
- a third decoder means connected to said third counting means and said plurality of memory means, for applying a signal to said recall enable input of the one of said plurality of memory means corresponding to said the count of said third counting means;
- a first display means connected to said third counting means for producing a display corresponding to the count of said third counting means; and
- a second display means connected to said memory storage output means of said plurality of memory means for producing a display corresponding to the number stored in said memory means having said third decoder means applying a signal to said recall enable input thereof.

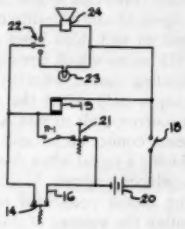
4,163,225
MAILBOX SIGNALLING DEVICE

George W. Engel, 126 Bay View Dr., Toms River, N.J. 08753

Filed Jul. 5, 1977, Ser. No. 812,750
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—569 3 Claims

1. A signalling device for a mailbox having a door, or the like, said device comprising, in combination,
- (a) a biased, normally closed, first electrical switch that is held open by said door when said door is closed,
- (b) a control box located at a position remote from said mailbox,

(c) control means located within said control box, said control means including,
(1) signalling means,
(2) an "on-off" switch,
(3) a normally closed re-set switch,
(4) latchable switching means consisting of a normally open switching portion and a current responsive portion for closing said switching portion,
(5) a source of electrical energy, and
(d) electrical circuit means consisting of
(1) a first loop from said source to said first switch and therefrom to said signalling means and therefrom through said "on-off" switch to said source,



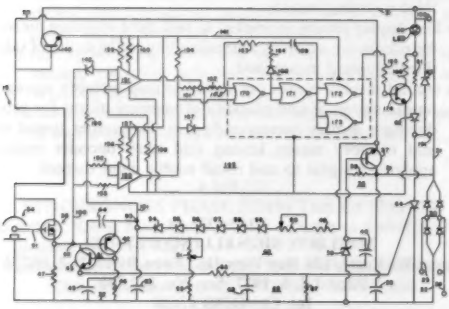
(2) a second loop from said source to said first switch and therefrom to said current responsive portion of said latchable switching means and therefrom through said "on-off" switch to said source, and
(3) a hold-in loop having two branches, the first of said branches leading from said source through said re-set switch to one side of said normally open portion of said latchable switching means and from the other side of said normally open portion through said current responsive portion thereof and said "on-off" switch to said source, and the second of said branches leading from said other side of said normally open portion to said signalling means and therefrom through said "on-off" switch to said source.

4,163,226

ALARM CONDITION DETECTING APPARATUS AND METHOD

Francis T. Ogawa, Lakewood, Colo., assignor to Statitrol Division Emerson Electric Co., Lakewood, Colo.

Filed Sep. 2, 1977, Ser. No. 830,326
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—629 **22 Claims**



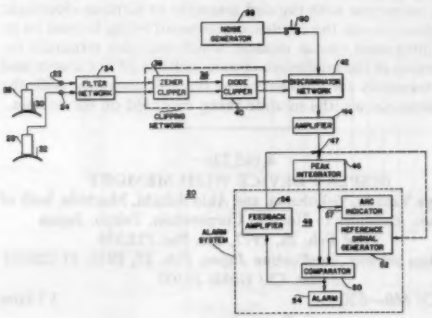
13. Apparatus for detecting the change of a selected condition from a normal to an alarm level, comprising:
a plurality of means for detecting the degree of the selected condition at points throughout a selected zone;
control means for supervising each of said condition detecting means, said control means having bus means for supplying operating power to each of said condition detecting means;
means connecting each of said condition detecting means across said bus means as parallel loads, each of said condition detecting means being operable to indicate whether the degree of the selected condition being detected is in a normal range, fault condition or alarm state by changes in its load impedance appearing across said bus means, said control means being operable in response to such changes in the parallel load appearing across said bus means to correspondingly indicate condition normal, fault occurrence or alarm state.

4,163,227

APPARATUS FOR MONITORING ARCING OF BRUSHES IN A DYNAMOELECTRIC MACHINE

Fred H. Sawada, Scotia; Frank M. Klementowski, Saratoga Springs, and James S. Bishop, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1978, Ser. No. 901,579
Int. Cl.[2] H02K *11/00*
U.S. Cl. 340—662 **11 Claims**

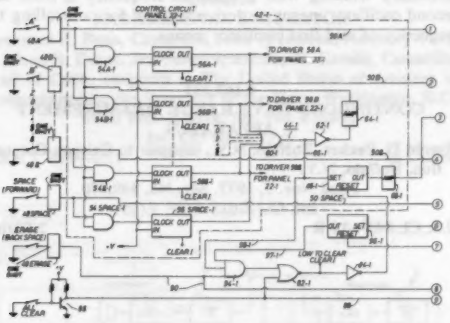


1. Apparatus for monitoring arcing of brushes in a generator wherein said arcing may be masked by high-amplitude noise spikes produced by solid-state switching devices in the excitation system of said generator, said apparatus comprising:
signal receiving means for receiving from a generator brush a composite signal including a brush arcing signal of amplitude S, a noise spike of amplitude N, and a low-frequency signal, said brush arcing signal and said noise spike occurring in the same high-frequency band and having a signal-to-noise ratio, S/N, which may be so low that said noise spike substantially masks said brush arcing signal from accurate detection;
a filter for removing said low-frequency signal from said composite signal;
a clipping network for removing from said composite signal all components above a preselected amplitude to provide a clipped signal with S′/N′ ratio at least equal to a preselected value, where S′ and N′ are respectively the amplitude of said brush arcing signal and said noise spike after their passage through said clipping network;
an amplifier responsive to said filtered and clipped composite signal to produce an amplified signal;
an integrator connected to said amplifier and operable to produce an integrated signal in response to said amplified signal; and
an alarm system operable to compare said integrated signal with a reference signal and to produce an alarm signal when said integrated signal exceeds said reference signal.

4,163,228
INFORMATION DISPLAY SYSTEM HAVING DIGITAL LOGIC INTERCONNECTIONS

Kambiz M. Sadjadi, 2420 Yorktown St., Apt. 485, Houston, Tex. 77056

Filed Jun. 27, 1977, Ser. No. 810,483
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—711 3 Claims



1. An information display system comprising:

a display board having plurality of display panels, each display panel having an array of lamps associated therewith which, when energized, visually transmit information to a viewer;

a keyboard having a plurality of keys, each key corresponding to an informational character, the actuation of any key generating an actuating signal of a first time duration;

control circuit associated with each display panel for energizing that panel in response to an actuating signal, each control circuit being connected to each key such that an actuating signal generated by actuation of any key is applied simultaneously to each control circuit;

a logic arrangement connected within each control arrangement, each logic circuit being responsive to the energization state of the display panel with which it is associated and to the energization states of the panels next-successive and next-previous thereto;

each logic arrangement being operative to enable the control circuit to energize its associated panel only upon the conditions that the next-previous panel is energized and the associated panel and the next-successive panel are not energized; and

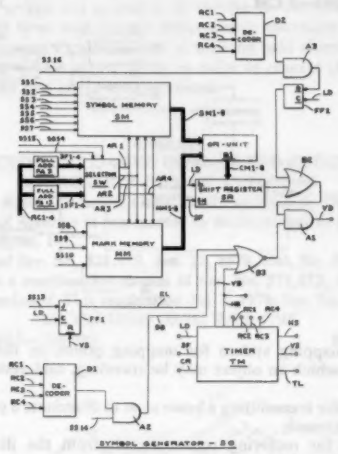
a delay circuit connected to each control circuit and to the control circuit of the next-successive panel, each delay circuit being responsive to the energization of the panel with which it is associated to apply to the next-successive panel, after a time delay greater than the first time duration, a signal respresentative of the energized state of the associated panel.

4,163,229
COMPOSITE SYMBOL DISPLAY APPARATUS

Leslie J. Bodin, Stonybrook, and Francis C. Marino, Dix Hills, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 18, 1978, Ser. No. 870,298
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—745 10 Claims

1. In a display system having a display device wherein each symbol is displayed as a set of rows of indicia, apparatus for transferring the rows of indicia to the display device comprising a source of groups of coded combinations of signal each representing a symbol to be displayed, each group having a first sub-group actually respresenting a basic symbol and a second sub-group representing a possible modification of the basic symbol, a first memory means having a plurality of storage locations for storing the sets of rows of indicia representing the basic symbols, a second memory means having a plurality of storage locations for storing sets of rows of indicia representing supplementary marks associated with some of the basic symbols, means for transferring the first sub-group of each group of coded combinations of signals to said first memory

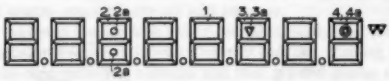


means for selecting for transfer to the display device the rows of indicia of a basic symbol and the second sub-group of each group of coded combinations of signals to said second memory means for selecting for transfer to the display device the rows of indicia of a supplementary mark whereby a modified symbol is displayed in response to the emission of one group of a coded combination of signals by said source.

4,163,230
DISPLAY DEVICE FOR ELECTRONIC TIMEPIECES

Tsuyoshi Konii, Kawagoe, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 705,258, Jul. 14, 1976. This application Jun. 27, 1977, Ser. No. 810,074
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—765 10 Claims



1. An electro-optical display for use in an electronic timepiece displaying at least a first function and a second function, said display comprising

a plurality of segmented numeric-display elements arranged in a course to display numbers representing information of the first and second functions of the timepiece,

at least one compound display element in said course of numeric-display, elements, said compound display element including

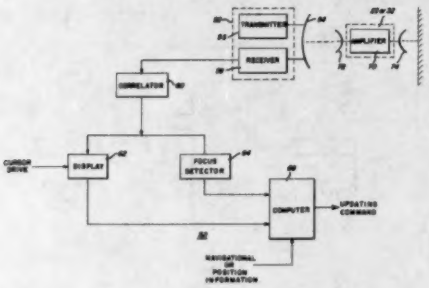
seven electro-optical display segments having rectangular shapes and positioned in a figure-eight pattern forming two free areas between the segments, said display segments being positioned to display a range of numerals representing information of the first function only of the timepiece upon selective actuation thereof, and

an electro-optical signal member having a non-rectangular shape and positioned within one of the two free areas between said electro-optical segments, said member indicating the second function only of the timepiece.

4,163,231
RADAR MAPPING TECHNIQUE

Henry D. Zuerndorfer, Lexington, Mass.; Hans A. Maurer, Tarzana, Calif., and Donald S. Banks, Wellesley, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1968, Ser. No. 695,432
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 CM 14 Claims



1. A mapping system for mapping points on the ground towards which an object may be traveling, said system comprising:

means for transmitting a beam so as to illuminate a portion of the ground;

means for receiving return signals from the illuminated portion of the ground;

means for correlating the return signals;

means for displaying the correlated signals and for indicating the location of a predetermined point on the ground;

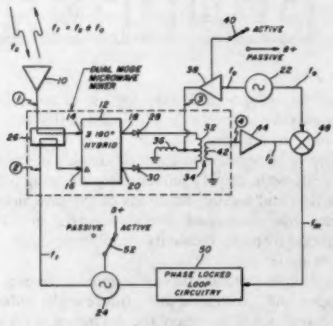
focus detection means connected to the output of the correlation means for indicating the location of the point on the ground towards which the object is actually traveling; and

means connected to the output of the display means and the focus detection means for comparing the signal outputs and for maintaining the predetermined point on the ground in the area of best focus.

4,163,232
DUAL MODE MICROWAVE MIXER

George W. Fitzsimmons, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 5, 1978, Ser. No. 922,258
Int. Cl.[2] G01S 9/56; H04B 7/14
U.S. Cl. 343—6.8 R 6 Claims

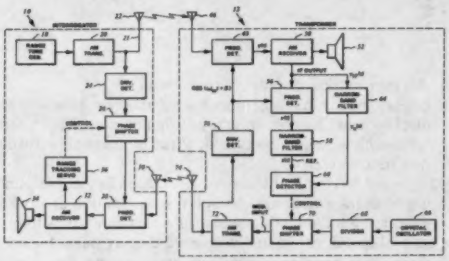


1. A dual mode microwave mixer comprising a 180° hybrid junction having a pair of input ports and a pair of output ports, means for applying a signal of frequency f_x to one of said input ports, first oscillator means for selectively applying a signal of frequency f_t to the other of said input ports, a transformer having primary and secondary windings, mixer diodes connecting the respective output ports of said hybrid junction to the opposite ends of said primary winding, second oscillator means for selectively applying a signal of frequency f_o to a center tap on said primary winding whereby a signal of frequency $f_x \pm f_o$ will appear at said one input port of the hybrid junction, a directional coupler operatively interconnecting said input ports, and means coupled to said secondary winding and operable when said signal of frequency f_t is applied to said other input port for mixing the signal appearing across said secondary winding with a signal of frequency f_o from said second oscillator means to derive a signal for controlling the frequency of said first oscillator means.

4,163,233
CONTINUOUS-WAVE RANGE MEASUREMENT APPARATUS

Harold D. Becker, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,370
Int. Cl.[2] G01S 9/37, 9/56
U.S. Cl. 343—12 R 2 Claims



1. Communication and ranging apparatus including:

interrogator means for transmitting a first ranging tone at a first carrier frequency and for receiving a second ranging tone; and

transponder means for receiving said first ranging tone and for transmitting said second ranging tone at second carrier frequency and including:

(a) a receiving antenna;

(b) receiver means producing an IF output;

(c) first product detector means having a first input connected to said receiving antenna and an output connected to said receiver means;

(d) first narrow-band filter means for extracting a component of said first carrier frequency from said IF output;

(e) second product detector means having a first input connected to said IF output and translating sideband energy in said IF output back to said first carrier frequency;

(f) second narrow-band filter means operatively connected to said second product detector means for producing a first carrier frequency carrier phase reference output;

(g) phase detector means operatively connected to said first and second narrow-band filter means and producing a control signal in response to said component of said first carrier frequency and said first carrier frequency carrier phase reference output;

(h) a ranging tone signal source for producing said second ranging tone;

(i) transmitter means for transmitting said second ranging tone at said second carrier frequency;

(j) phase shifter means for modulating said signal at said second ranging tone and communicating said modulated signal to said transmitter means in response to said control signal; and

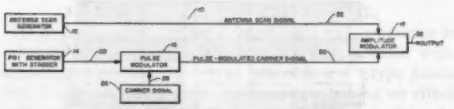
(k) means for supplying a sinusoidal signal derived from

said second ranging tone at said second carrier frequency as a second input to said first and second product detector means whereby said first ranging tone at said first carrier frequency received at said receiving antenna is made phase coherent with respect to modulation on said first ranging tone and said first carrier frequency component is reduced to zero in said first product detector means.

4,163,234
RADAR SIGNAL SIMULATOR

Lawrence A. Beno, Camarillo; John T. Harrell, Newbury Park; Albert B. Evans, Jr., Ventura, and Jay R. Gaudig, Camarillo, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1978, Ser. No. 875,831
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—17.7 **26 Claims**

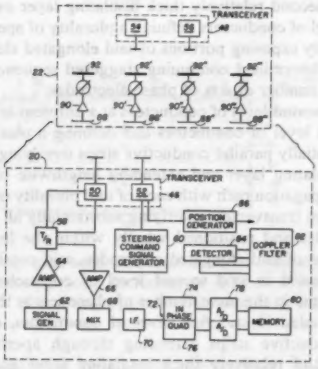


1. An antenna scan pattern generator for producing a simulated radar antenna pattern comprising:
   a. means for generating a pulse-modulated carrier signal;
   b. means for generating an antenna scan signal; said antenna scan signal generating means including:
      (1) means for generating a modulation signal, said modulation signal being said antenna scan signal uncompensated for range;
      (2) means for generating a range information signal;
      (3) a summing circuit for summing said modulation signal and said range information signal thereby generating said antenna scan signal; and
   c. means for modulating said pulse-modulated carrier signal by said antenna scan signal thereby generating said simulated radar antenna pattern.

4,163,235
SATELLITE SYSTEM

Jack L. Schultz, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,488
Int. Cl.[2] H01Q 3/26; H04B 7/14
U.S. Cl. 343—100 SA **9 Claims**

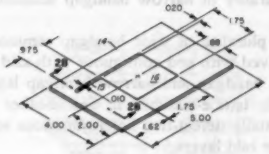


5. An antenna system in space for receiving and transmitting electromagnetic wave energy comprising a space fed phased array system including:
   first and second broadside arrays of radiating elements, one of said arrays on each side of a common ground plane, said first array being operative to receive and transmit signals between the system and a ground location,
   electronic phase control means electrically connected between said broadside arrays for transmitting electrical signals between said arrays and for varying the relative phase of the signal in response to a remote control signal,
   a remote command module located at some distance from said arrays and operative to receive an electromagnetic signal from said second array, derive electronic steering commands therefrom and to transmit said steering command to said second array in order to control the operation of said phase control means.

4,163,236
REACTIVELY LOADED CORNER FED ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 871,573, Jan. 23, 1978, Pat. No. 4,117,489, which is a continuation-in-part of Ser. No. 571,152, Apr. 24, 1975, abandoned. This application Jul. 3, 1978, Ser. No. 921,912
Int. Cl.[2] H01Q 00/00, 9/38, 1/48
U.S. Cl. 343—700 MS **10 Claims**



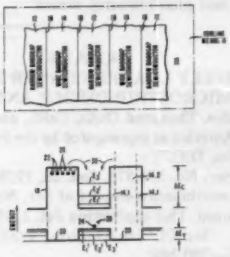
1. A corner fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:
   a. a thin ground plane conductor;
   b. a thin square radiating element spaced from said ground plane;
   c. said radiating element being electrically separated from said ground plane by a dielectric substrate;
   d. said radiating element having a single feed point located at only one corner thereof;
   e. the length and width of said radiating element being equal and determining the resonant frequency along the length and width, respectively, of said antenna;
   f. the antenna bandwidth being variable with the width dimension of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width;
   g. the polarization of said antenna being linear along the diagonal on which the feed point lies and the resonant frequencies being equal along both the length of the antenna and along the width of the antenna when there is zero phase difference between the antenna's two modes of oscillation;
   h. said square radiating element being provided with a reactive loading means which is operable to change the effective length of said radiating element as to the width thereof without changing the physical dimensions of the radiating element from a square having equal sides, said reactive load means being operable to change the radiation pattern of said antenna from linear to elliptical and circular polarization by advancing one mode of current oscillation and retarding the other mode of current oscillation until there is a phase difference between the two modes of oscillation.

4,163,237

HIGH MOBILITY MULTILAYERED HETEROJUNCTION DEVICES EMPLOYING MODULATED DOPING

Raymond Dingle, Summit; Arthur C. Gossard, Warren, and Horst L. Störmer, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1978, Ser. No. 899,402
Int. Cl.[2] H01L *29/161*
U.S. Cl. 357—16 11 Claims



1. A high mobility semiconductor device comprising:

a first plurality of narrow bandgap semiconductor layers, and

a second plurality of wide bandgap semiconductor layers interleaved with and contiguous with said first plurality,

said wide bandgap and narrow bandgap layers being substantially lattice-matched to one another so as to form substantially defect-free heterojunctions at the interfaces between said layers,

said layers having a conduction or valence band step of sufficient magnitude to confine carriers to said narrow bandgap layers, and characterized in that

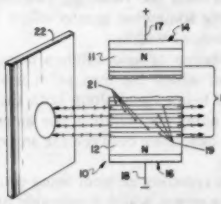
said layers are adapted such that the impurity-concentration-thickness product of said wide bandgap layers exceeds the impurity-concentration-thickness product of said narrow bandgap layers.

4,163,238

INFRARED SEMICONDUCTOR DEVICE WITH SUPERLATTICE REGION

Leo Esaki, Chappaqua, and Raphael Tsu, Mt. Kisco, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1978, Ser. No. 914,099
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 13 Claims



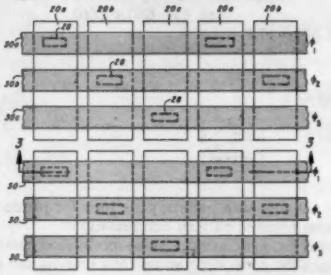
1. An optical device comprising a superlattice semiconductor element, said semiconductor element including a plurality of alternating barrier and light emitting layers, said light emitting layers each having a pair of allowed states separated by an energy corresponding to a light frequency, means for applying a voltage across said superlattice semiconductor element transverse to said layers, and means for conveying light corresponding to said light frequency to said light emitting layers.

4,163,239

SECOND LEVEL PHASE LINES FOR CCD LINE IMAGER

David L. Carter, Upper Montclair, N.J., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 524,437, Nov. 18, 1974, abandoned, which is a division of Ser. No. 414,484, Nov. 9, 1973, Pat. No. 3,869,572, which is a continuation of Ser. No. 214,365, Dec. 30, 1971, abandoned. This application Jan. 3, 1977, Ser. No. 756,505
Int. Cl.[2] H01L *27/04, 29/78;* G11C *19/28*
U.S. Cl. 357—24 5 Claims



1. An optical imager comprising a charge coupled device shift register defining a signal propagation path and including:

(a) a semiconductor substrate having a first relatively thin insulating layer over one surface thereof;

(b) a first level of conductors defining a plurality of elongated electrodes over said first insulating layer, said electrodes extending transversely of said signal propagation path and in spaced parallel relation with each other along said propagation path, the elongated electrodes included in said first level of conductors being arranged in at least two sets of phase electrodes wherein the respective electrodes included in the sets of phase electrodes are arranged consecutively to define a sequence of successive electrodes from each of the sets of phase electrodes;

(c) a second relatively thick insulating layer over said first level of conductors defining a plurality of apertures selectively exposing portions of said elongated electrodes in a predetermined continuing staggered sequence related to the number of sets of phase electrodes;

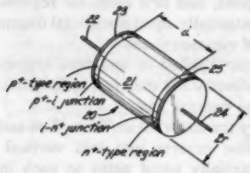
(d) a second level of conductors at a different level than said first level of conductors and defining a plurality of substantially parallel conductive strips overlying said second insulating layer and extending lengthwise of said signal propagation path with each of said plurality of conductive strips transversely overlying substantially all of said electrodes and positioned wholly within the length dimensions of said elongated electrodes, said conductive strips included in said second level of conductors being arranged in the same number of phase sets as the electrodes included in said first level of conductors, each of said conductive strips extending through apertures in said second relatively thick insulating layer and ohmically contacting only electrodes included in the set of phase electrodes to which the respective conductive strip corresponds; and

(e) means for selectively applying individual phases of multiphase clocks to respective ones of said conductive strips.

4,163,240
SENSITIVE SILICON PIN DIODE FAST NEUTRON DOSIMETER

Philip R. Swinehart, Columbus, and John M. Swartz, Westerville, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Mar. 21, 1977, Ser. No. 779,346
Int. Cl.[2] H01L 27/14
U.S. Cl. 357—29 8 Claims

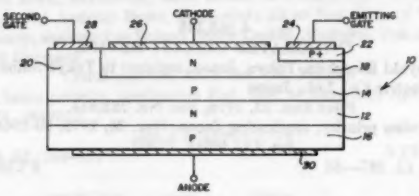


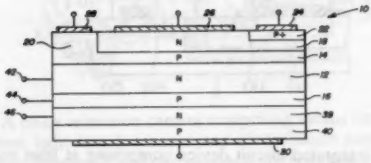
1. A personnel dosimeter comprising a semiconductor mass wherein said semiconductor mass is silicon diffused with an impurity to provide a p^+-type junction, a n^+-type junction, and a high resistivity zone therebetween, having an effective bulk carrier lifetime greater than about 100 microsecs., and said mass is formed to present a structure in which the ratio of its edge area to volume is equal to, or greater than, four times its inverse base width.

4,163,241
MULTIPLE EMITTER AND NORMAL GATE SEMICONDUCTOR SWITCH

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Continuation of Ser. No. 586,741, Jun. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 538,917, Jan. 6, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,686
Int. Cl.[2] H01L 29/74
U.S. Cl. 357—38 6 Claims





1. An emitter gate semiconductor rectifier comprising:

a semiconductor body including at least four interleaved layers of alternating opposite first and second semiconductor conductivity types to form a plurality of P-N junctions;

said semiconductor body having a first exterior layer of said first semiconductor conductivity type and a second exterior layer of said second semiconductor conductivity type;

an emitting gate region of said first semiconductor conductivity type formed in said second exterior layer of said semiconductor body;

a first gate electrode contacting said emitting gate region to provide switching control of said rectifier;

an anode electrode contacting said first exterior layer of said semiconductor body;

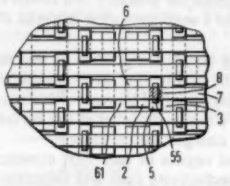
a cathode electrode contacting said second exterior layer of said semiconductor body; and

a second gate electrode contacting an intermediate layer of said semiconductor body having said first semiconductor conductivity type, said intermediate layer extending through a portion of said second exterior layer and said second gate electrode lying adjacent said cathode electrode but which is electrically and spatially isolated from said emitting gate region.

4,163,242
MOS STORAGE INTEGRATED CIRCUIT USING INDIVIDUAL FET ELEMENTS

Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 414,215, Nov. 9, 1973, abandoned. This application May 16, 1977, Ser. No. 797,339
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1972, 2255529
Int. Cl.[2] H01L 27/10
U.S. Cl. 357—41 1 Claim



1. An integrated circuit comprising a semiconductor substrate and a plurality of one-transistor storage cells supported on said substrate, each of said storage cells having an individual field effect transistor and a capacitor connected in series therewith, said field effect transistors being formed in a single plane by a plurality of spaced pairs of diffusion zones in a surface of said substrate, said substrate forming a channel zone between each of said pairs of diffusion zones, a first diffusion zone of each of said pairs being formed as a common diffusion zone shared with a plurality of said field effect transistors, said integrated circuit including a first electrically insulating layer superposed on said surface of said substrate, a first electrically conducting coating superposed on said insulating layer between the two diffusion zones of each pair of said zones to form a gate electrode of a field effect transistor, a second electrically conductive coating superposed on said insulating layer to form an electrode of a capacitor connected in series with each field effect transistor, said first and second conductive coatings being disposed in a single conductor plane, a second insulating layer superposed on said first and second conducting layers and having a plurality of recesses aligned with a portion of each gate electrode, whereby each of said recesses is disposed at least partially above a channel zone of a transistor of a one-transistor storage cell, and a third electrically conductive layer in the form of a strip superposed on said second insulating layer for establishing electrical contact through said recesses, with the gate electrodes of a plurality of field effect transistors located partially under said strip, said first diffusion zones being disposed in said substrate in a plurality of elongate, spaced apart parallel zones each defining a column of said transistors, said strips being disposed in a plurality of elongate, spaced apart parallel strips transverse to said first diffusion zones each defining a row of said transistors, the transistors in each said row being arranged in back-to-back relationship in pairs, with the transistors of each pair being

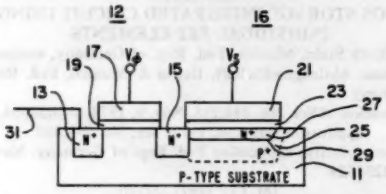
located between and connected to adjacent ones of said first diffusion zones, and being separated in a direction transverse to said rows, by adjacent ones of said strips from others of said pairs.

4,163,243

ONE-TRANSISTOR MEMORY CELL WITH ENHANCED CAPACITANCE

Theodore I. Kamins, Mt. View, and Charles G. Sodini, San Francisco, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 30, 1977, Ser. No. 838,199
Int. Cl.[2] H01L *27/04*; G11C *11/24*
U.S. Cl. 357—41 **3 Claims**



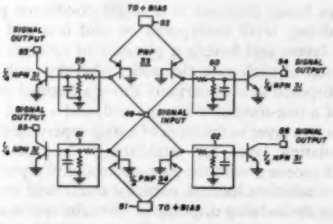
1. A semiconductor memory cell comprising:
a substrate of a semiconductor material of a first conductivity type;
an insulating layer on a portion of said substrate;
an electrically conducting gate on said insulating layer having a voltage applied thereto with respect to said substrate to create a depletion layer at the surface of said substrate in which charges can be stored;
an enhanced region of said first conductivity type but of higher conductivity than said substrate under said electrically conducting gate and extending from said insulating layer into said substrate, said depletion layer and any charges stored therein lying substantially wholly within said enhanced region;
gating means for introducing charge into said cell to represent a logical state and allowing sensing of charge in said cell to indicate a logical state represented by charge stored in said cell.

4,163,244

SYMMETRICAL INTEGRATED INJECTION LOGIC CIRCUIT

Louis J. Ragonese, and Neng-Tze Yang, both of Liverpool, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,375
Int. Cl.[2] H01L *27/04*
U.S. Cl. 357—44 **13 Claims**



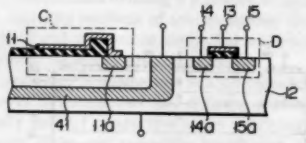
1. In a monolithic integrated injection logic circuit, the combination comprising:
(a) at least a first, second, and third vertical transistor means formed on a substrate, each comprising:
(1) a first emitter region of a first polarity material,
(2) a first base region of a second polarity material lying above and next to said first emitter region to form an input junction,
(3) a plurality of separate first collector regions of a material of said first polarity, disposed on top of and horizontally bounded by a continuation of the material of which said first base region is formed so as to form a plurality of separate output junction regions and a like plurality of incremental vertical transistors localized under said collector regions, said first collector regions being arranged at substantially equal horizontal distances from a first center of symmetry, and
(4) a base contact applied to said base region near said center of symmetry for matched collector current response to base control, and
(b) complementary transistor means formed on said substrate for injecting base current into said vertical transistor means in substantially equal paths to each incremental vertical transistor, comprising:
(1) a second emitter region of a material of said second polarity,
(2) a second base region of a material of said first polarity next to said second emitter region to form at least one input junction,
(3) a second collector region of a material of said second polarity next to said second base region to form at least one injector output junction and formed as a continuation of the material of which said first base region is formed for base current injection to said vertical transistor means, and
(c) means connecting a first collector region of each of said first and second vertical transistor means to the first base region of said third vertical transistor means.

4,163,245

INTEGRATED CIRCUIT DEVICE

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 23, 1976, Ser. No. 753,814
Claims priority, application Japan, Dec. 26, 1975, 50-156621
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—51 **6 Claims**

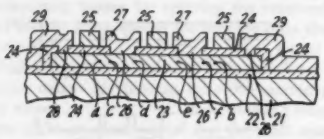


1. An integrated circuit device comprising at least one capacitive circuit element, at least one MOS active circuit element having at least one p-n junction, both elements being formed on a semiconductor substrate of one conductivity type and a carrier absorption region of an opposite conductivity type to that of said semiconductor substrate formed in said semiconductor substrate between said capacitive element and said MOS active element, said absorption region being impressed with the highest absolute level of voltage among those impressed on said circuit elements included in said integrated circuit device to catch minority carriers injected from said MOS active circuit element into said semiconductor substrate.

4,163,246
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE EMPLOYING A POLYCRYSTALLINE SILICON AS A WIRING LAYER

Kunio Aomura, and Kenji Okada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1978, Ser. No. 874,551
Claims priority, application Japan, Feb. 7, 1977, 52-12760
Int. Cl.² H01L 23/48
U.S. Cl. 357—68 **13 Claims**

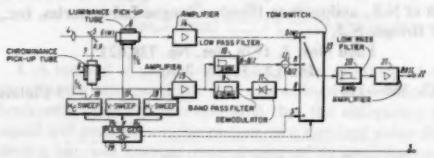


1. A semiconductor device comprising a semiconductor substrate, an insulating film formed on a major surface of said semiconductor substrate; a first wiring structure including an elongated silicon layer formed on said insulating film, first and second electrical connections respectively made to a first and a second portion of said silicon layer, and at least one metallic layer electrically coupled to a third portion of said silicon layer between said first and second portions; and a second wiring structure including a conductive layer running over and isolated from a fourth portion of said silicon layer between said first and second portions, said conductive layer of said second wiring structure being isolated from said metallic layer of said first wiring structure, and said fourth portion being positioned between said third portion and one of said first and second portions.

4,163,247
COLOR TELEVISION CAMERA WITH TIME MULTIPLEXING OF LUMINANCE AND CHROMINANCE INFORMATION

Gerd Bock, Brunswick; Gerd Grand, Braunschweig-Watenbuttel, and Andreas Ilmer, Brunswick; all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 29, 1977, Ser. No. 792,260
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619027
Int. Cl.² H04N 9/04
U.S. Cl. 358—12 **5 Claims**

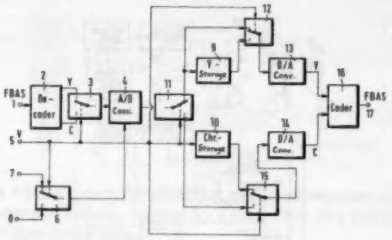


1. A color television camera comprising means for splitting incident light into luminance and chrominance components, separate luminance and chrominance opto-electric transducer means arranged to receive on light sensitive surfaces thereof focussed images of the luminance and chrominance components respectively of the incident light, respective means for effecting line-by-line scanning of the light sensitive surfaces of the luminance and chrominance transducer means to produce electrical signals bearing luminance and chrominance information respectively, the scanning means for the chrominance transducer means being adapted to effect line scanning of the chrominance component during the line blanking intervals of the scanning means for the luminance component, and means for interleaving by time division multiplex electrical signals derived from the luminance and chrominance transducer means.

4,163,248
FIELD SEQUENTIAL TRANSMISSION OF LUMINANCE AND CHROMINANCE INFORMATION

Jürgen Heitmann, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 839,111
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2644706
Int. Cl.² H04N 9/02, 9/40
U.S. Cl. 358—12 **20 Claims**

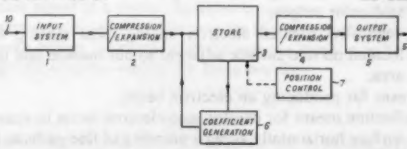


1. In a method of transmitting a color T.V. signal from a receiver into a recorder, from a transmitter to a receiver, from a color T.V. camera into a transmitter, or the like, the step of transmitting the luminance component and the chrominance component of the color T.V. signal alternately and during different respective field-periods of the T.V. signal.

4,163,249
PICTURE PROCESSING SYSTEM FOR TELEVISION

Peter C. Michael, Newbury; Richard J. Taylor, Barnes, and Martin R. Trump, Newbury, all of England, assignors to Micro Consultants Limited, Berkshire, England

Filed Oct. 12, 1977, Ser. No. 841,519
Claims priority, application United Kingdom, Oct. 14, 1976, 42751/76; Jul. 26, 1977, 31355/77; Jul. 26, 1977, 31356/77; Jul. 26, 1977, 31357/77; Jul. 26, 1977, 31358/77; Jul. 29, 1977, 31996/77
Int. Cl.² H04N 9/535
U.S. Cl. 358—21 R **21 Claims**

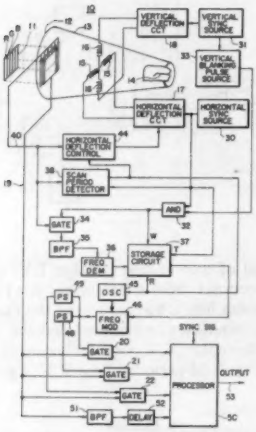


1. A T.V. picture processing system comprising:
(a) input means for receiving T.V. picture information;
(b) input processing means for modifying the size of the picture from information received from said input means;
(c) storage means for storing the input processed picture information;
(d) co-efficient generator means connected to said store for providing modification of incoming data to said store in dependence on the co-efficient generated and on data stored in said store;
(e) output processing means for modifying the size of the picture from information received from said storage means; and
(f) output means for receiving the information from said output processing means.

4,163,250
INDEX TUBE COLOR TELEVISION SYSTEM WITH DEFLECTION RATE ERROR CORRECTION

Kaoru Tomii, and Yoshihiro Hosokawa, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 16, 1977, Ser. No. 861,428
Claims priority, application Japan, Dec. 17, 1976, 51/152520
Int. Cl.[2] H04N 9/07, 9/24
U.S. Cl. 358—45 7 Claims



1. A color television system, comprising:

a surface having an image area on which an image is formed;

periodically repetitive groups of vertically oriented color stripes located on said image area;

a plurality of electron impingement sensors located in a single horizontal row on said surface adjacent to but outside said image area and positionally associated with said color stripes;

a vertically oriented electron impingement sensing stripe located on said surface adjacent to but outside said image area;

means for producing an electron beam;

deflection means for causing said electron beam to scan said surface horizontally along a plurality of line paths to form successive rasters on said surface, thereby resulting in the generation of a first index signal produced in response to the impingement of said beam upon said plurality of sensors at the start of the formation of each raster, and a second index signal produced in response to the impingement of said beam upon said sensing stripe at the start of each horizontal line scan;

pulse repetition rate-to-voltage conversion means for converting the first index signal into a voltage signal representative of the instantaneous pulse repetition rate of the first index signal and thereby of the instantaneous sweep speed of the electron beam;

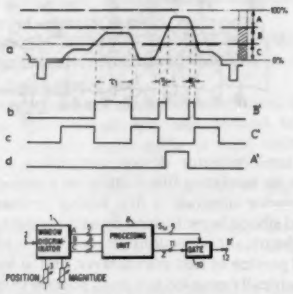
storage means including a plurality of storage locations; and

storage device control means for writing said voltage signal into said storage locations of said storage means at the start of each raster scan and retrieving the stored signal at intervals in response to said second index signal.

4,163,251
APPARATUS FOR THE AMPLITUDE DISCRIMINATION OF A VIDEO SIGNAL

Gerhard R. Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,835
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711611
Int. Cl.[2] H04N 7/18, 5/14
U.S. Cl. 358—107 9 Claims

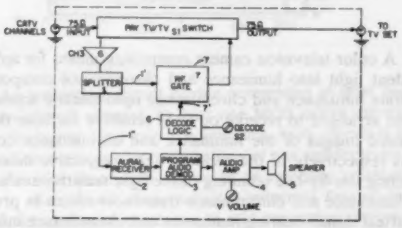


1. In an apparatus for the amplitude discrimination of a video signal of the kind in which the video signal is applied to a window discriminator which is adapted to deliver a first binary signal during periods when the amplitude of the video signal lies in a predetermined sub-range of the total amplitude range of the video signal, the improvement comprising means for producing a second binary signal during periods when the amplitude of the video signal lies below the said amplitude sub-range and a third binary signal when the amplitude of the video signal lies above the said amplitude sub-range, means for storing the binary signals, means for analysing the stored signals two-dimensionally in accordance with a predetermined criterion to determine whether the first binary signal at any instant corresponds to an edge transition between a picture area whose video signal amplitude lies above the said sub-range and a picture area whose video signal amplitude lies below the said sub-range, and means for suppressing the first binary signal when such criterion is fulfilled.

4,163,252
SUBSCRIPTION TELEVISION DECODER APPARATUS

Kantilal Mistry, Old Bridge, and Martin Sperber, Cranford, both of N.J., assignors to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Nov. 3, 1976, Ser. No. 738,621
Int. Cl.[2] H04N 7/16
U.S. Cl. 358—118 5 Claims



1. In a scrambled-and-encoded television signal decoding and unscrambling apparatus for use with television radio-frequency signals that comprise an encoded aural signal comprising audio-program and pilot tone signals and a scrambled video

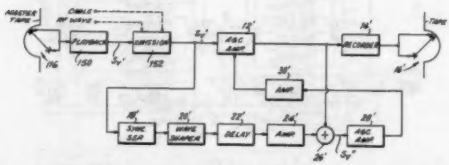
signal including a repetitive modulation of scan synchronizing signals that has attenuated the same to substantially blanking level, but without affecting and altering the video signal information, with the rate of such blanking adjusted to a value that produces psychological discomfort to a viewer of the resulting shifting television picture on a normal receiver; apparatus having, in combination, means for receiving said television signals; switching means operable in one position to apply said signals along a direct path to a television receiving set and in another position to apply said signals through a decoding and unscrambling path to said set; said decoding and unscrambling path comprising means for splitting the received signals into first and second parts; means for feeding only the first part of the received signals, including the video signal information, but excluding said second part, to radio-frequency gated amplifier means; means for feeding only the second part to aural receiver means including audio demodulating means for recovering the audio program signal and the pilot tone signal, and without passing the second part through said gated amplifier means; decoding logic means responsive to the recovered pilot tone signal and connected between said audio demodulating means and said amplifier means to control the amplifier means to restore the synchronizing signals to normal level and thus stop the repetitive television picture shifting in accordance with the said pilot tone signal recovery, thus restoring the scan synchronizing signals to the video signal; means for amplifying and reproducing the decoded program audio signal output of said audio demodulating means; and means for applying the synchronizing signal-restored video signal output of said radio-frequency gated amplifier means to said television receiving set.

4,163,253

METHOD OF AND APPARATUS FOR MODIFYING A VIDEO SIGNAL TO PREVENT UNAUTHORIZED RECORDING AND REPRODUCTION THEREOF

Minoru Morio, and Masahiro Kambara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,242
Claims priority, application Japan, Mar. 23, 1976, 51-31592
Int. Cl.² H04N 7/16
U.S. Cl. 358—120 **20 Claims**



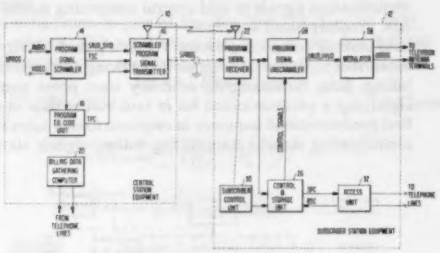
1. A method of providing an anti-piracy video signal of the type having horizontal line intervals defined between periodic horizontal blanking intervals such that the anti-piracy video signal will produce a video picture on a standard video display device but will prevent reproducing of an unauthorized recording of such signal by means of a video recorder having an automatic gain control circuit responsive to predetermined portions of the video signal in said horizontal blanking intervals; said method comprising the steps of generating pulse signals each having an amplitude which is sufficient to cause overcompensation of said automatic gain control circuit when made effective on the latter at the same time as one of said predetermined portions of the video signal, and inserting said generated pulse signals into respective horizontal blanking intervals of said video signal at fixed locations relative to said predetermined portions of the video signal such that, on unauthorized recording of the resulting anti-piracy video signal by said video recorder, said overcompensation of the automatic gain control circuit occurs and the resulting recorded video signal is excessively attenuated.

4,163,254

METHOD AND SYSTEM FOR SUBSCRIPTION TELEVISION BILLING AND ACCESS

Robert S. Block, 8620 N. Pelham Pkwy., Milwaukee, Wis. 53217, and John R. Martin, 3129 W. Mill Rd., Milwaukee, Wis. 53209

Filed Feb. 14, 1977, Ser. No. 768,404
Int. Cl.² H04N 7/16, 7/00
U.S. Cl. 358—122 **14 Claims**



1. A billing system for obtaining billing information regarding programs actually viewed by a subscriber of a pay television system comprising:

means for transmitting at a predetermined carrier frequency a scrambled television program signal containing a block of television program material and an identification code unique to the block of program material being transmitted;

means at a subscriber station for selectively receiving the transmitted program signal and for selectively unscrambling the program signal to permit viewing of the block of program material being transmitted in response to subscriber action indicating acceptance for viewing of the block of program material;

means for detecting the identification code in the program signal received at the subscriber station and for temporarily storing a program identification code for subsequent transmission as an electrical signal in response to the detected identification code and to the subscriber action indicating acceptance for viewing of the block of program material; and

means connected to said detecting and storing means for selectively accessing the program identification code stored at the subscriber station on other than a real time basis and for transmitting the stored program identification signal to a remote location in response to a command signal received from the remote location to thereby provide billing information at the remote location as to programs actually viewed by the subscriber.

4,163,255

BILLING METHOD AND SYSTEM FOR A SUBSCRIBER OF A PAY TELEVISION SYSTEM

H. George Pires, Parlin, N.J., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.

Continuation of Ser. No. 737,856, Nov. 1, 1976, Pat. No. 4,115,807, which is a continuation-in-part of Ser. No. 706,929, Jul. 19, 1976, Pat. No. 4,068,264. This application Jun. 15, 1978, Ser. No. 915,935
Int. Cl.² H04N 7/16
U.S. Cl. 358—122 **8 Claims**

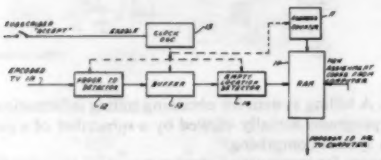
1. In a pay television system furnishing television programs to a plurality of subscribers each having receiving-decoding means for receiving encoded television signals and furnishing corresponding decoded television signals, each of said receiving-decoding means having decoder storage means having a plurality of decoder storage locations including a first set of decoder storage locations for storing billing data indicative of charges to be billed to said subscriber and a second set of decoder storage locations for storing a subscriber identification

number, said pay television system having central computing means for computing the charge to each of said subscribers in response to billing signals applied thereto, said central computing means having computer storage means having a plurality of computer storage locations:

a billing method of one of said subscribers, comprising, in combination, the steps of:

at said receiving-decoding means: generating billing signals and subscriber identification signals, corresponding, respectively to said billing data and said subscriber identification number; and transmitting said billing and subscriber identification signals to said central computing means in a first predetermined sequence;

at said central computing means: receiving said billing and subscriber identification signals and storing corresponding billing data; furnishing an arbitrary start point number signifying a predetermined bit in said billing data in said first predetermined sequence in response to said subscriber identification signals; transmitting billing signals starting



at said arbitrary start point and said subscriber identification signals back to said receiving-decoding means in a second sequence having a predetermined relationship to said first sequence, whereby only selected ones of said billing signals determined in accordance with said arbitrary start point number are transmitted back to said receiving-decoding means; and transmitting confusion signals in place of the remaining one of said billing signals;

at said receiving-decoding means: reading-out data from said decoder storage locations starting at said arbitrary start point number in said second predetermined sequence, thereby furnishing read-out signals; receiving said billing and customer identification signals transmitted by said central computing means and furnishing corresponding decoder-received signals; comparing said read-out signals to said decoder-received signals; and erasing said billing data stored in said first set of decoder storage locations only upon correspondence between said read-out signals and said decoder received signals, thereby clearing said first set of decoder storage locations for new billing data.

4,163,256

ELECTRONIC PHOTOGRAPHY SYSTEM

Willis A. Adcock, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 736,975, Oct. 29, 1976, Pat. No. 4,057,830, which is a continuation of Ser. No. 543,106, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 460,396, Apr. 12, 1974, abandoned, which is a continuation of Ser. No. 266,826, Jun. 27, 1972, abandoned. This application Jun. 23, 1977, Ser. No. 809,258

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.[2] H04N *5/78, 7/18*

U.S. Cl. 358—127 **2 Claims**

1. An electronic still picture photography system comprising:

(a) an electronic camera including:

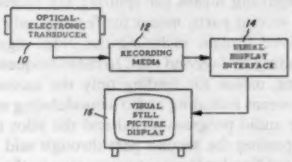
(i) an optical electronic image transducer device having storage capability for storing data representing an optical image;

(ii) a scanning means for scanning said image transducer to read said data; and

(iii) a momentary actuation means;

(b) a recording apparatus for recording said data received from said electronic camera on a selected portion of a recording medium;

(c) means coupling said momentary actuation means to said recorder apparatus for controlling said recorder to record data representing a different single optical image on each such selected portion of said recording medium in response to each different actuation;



(d) a playback apparatus for reading, one at a time, selected ones of said single optical images from said recording medium, said playback apparatus including means for generating a video signal to play back said selected ones of said optical images on a television receiver-type display device.

4,163,257

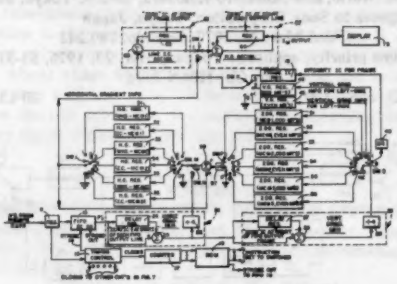
SPATIAL TONER FOR IMAGE RECONSTITUTION

Stanley A. White, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1977, Ser. No. 864,962

Int. Cl.[2] H04N *7/12*

U.S. Cl. 358—133 **6 Claims**



1. An apparatus for reconstituting picture point intensity signals representative of a video image from a sequence of two-dimensional, data-compacted, received pixels, said apparatus comprising:

means for utilizing the first one of the sequence of received data-compacted pixels to develop the initial intensity of the first one of a plurality of horizontal lines in a reconstituted picture;

means for selectively generating horizontal and vertical gradient information as a function of the received pixels;

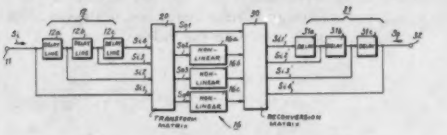
means selectively responsive to the initial intensity of any given horizontal line in the reconstituted picture and to associated vertical gradient information for developing by a first interpolation the initial intensity for the following horizontal line; and

means selectively responsive to the initial intensity of said given horizontal line and to the horizontal gradient information associated with said given horizontal line for computing a sequence of picture point intensity signals along said given horizontal line by second interpolations.

4,163,258
NOISE REDUCTION SYSTEM

Norio Ebihara, and Kaichi Tatsuzawa, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 753,081
Claims priority, application Japan, Dec. 26, 1975, 50-157206
Int. Cl.[2] H04N *5/21, 7/04;* H04B *1/10;* G01T *1/16*
U.S. Cl. 358—167 24 Claims

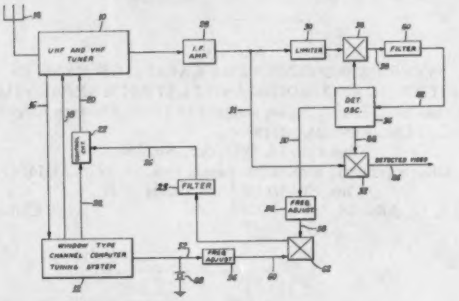


1. A method of reducing the noise of an input signal having components present in a give frequency spectrum, comprising the steps of deriving an orthogonal transform of said input signal, said orthogonal transform having n transformed signal components representing different respective portions of the frequency spectrum of said input signal; suppressing those transformed signal components , other than the transformed signal component representing the lower portion of said frequency spectrum, whose signal levels are less than a threshold level; and reconverting said n transformed signal components, less said suppressed components, substantially into said input signal.

4,163,259
WINDOWED TUNING SYSTEM WITH SYNCHRONOUS DETECTOR

Peter C. Skerlos, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 14, 1977, Ser. No. 860,505
Int. Cl.[2] H04N *5/44, 5/50*
U.S. Cl. 358—191 9 Claims



1. In a television receiver having a tuner for tuning the receiver to a restricted frequency "window" about the nominal carrier frequency of a desired channel; a combined video detection and automatic frequency control system for detecting the video components of an intermediate frequency signal derived from the carrier frequency and for locking the tuner to the carrier frequency of a received television signal, comprising:

a synchronous detector receiving the intermediate frequency signal for demodulating the video components thereof, said synchronous detector including a detector oscillator electronically tunable to a predetermined nominal frequency of intermediate frequency signal;

a fixed frequency reference oscillator;

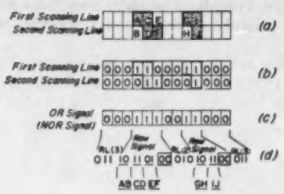
control means receiving the output of said detector oscillator and the output of said reference oscillator for developing a control signal representative of the deviation of the detector oscillator frequency from the nominal frequency of the intermediate frequency signal; and

means for coupling the control signal to the tuner for locking the tuner to the frequency of the received carrier signal.

4,163,260
SYSTEM FOR REDUCING BAND WIDTH OF IMAGE SIGNAL

Nobuyoshi Hisao, Neyagawa, and Takeshi Agui, Yokohama, both of Japan, assignors to Mita Industrial Company, Osaka, Japan

Continuation-in-part of Ser. No. 760,312, Jan. 18, 1977, abandoned. This application Jan. 9, 1978, Ser. No. 867,868
Claims priority, application Japan, Jan. 24, 1976, 51/6876
Int. Cl.[2] H04N *1/00*
U.S. Cl. 358—261 6 Claims

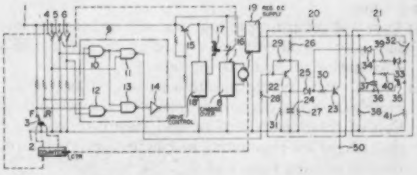


1. A system for reducing or compressing the band-width of image signals comprising circuit means for logically summing bit signals of picture elements in the same position on at least two scanning lines to form an 0-section and a 1-section, and circuit means for coding by a run length code said 0- and 1-sections for transmission.

4,163,261
OVERLAP RECORDING DEVICE FOR SOUND CINECAMERA

Isami Ito, Suwa, Japan, assignor to Chinon Industries Incorporated, Suwa, Japan

Filed Aug. 29, 1977, Ser. No. 828,770
Claims priority, application Japan, Nov. 11, 1976, 52-135556
Int. Cl.[2] G11B *27/02*
U.S. Cl. 360—13 8 Claims



1. An overlap recording device for a sound cinecamera provided with a reversible, film feeding motor and an electric circuit for sound recording, said electric circuit having means for supplying a recording signal to be recorded and an AC recording bias current for erasing sounds previously recorded, said overlap recording device comprising:

operating means actuable for reversing and restoring forward motion of said motor, as well as for generating an instruction signal;

a controlling signal generating circuit means responsive to said instruction signal for (1) generating a sound record controlling signal during the time of film reverse-winding for overlap recording, and for (2) changing said controlling signal according to a predetermined time constant at the time of restarting forward film feeding by said film feeding motor;

a sound recording signal control circuit means responsive to

said changing of said controlling signal for raising the level of said recording signal in said sound recording circuit in correspondence thereto;

AC bias control circuit means simultaneously responsive to said changing of said controlling signal for raising the level of said AC recording bias current to said sound recording circuit and correspondingly the erasing effect on a previously recorded sound, in correspondence thereto;

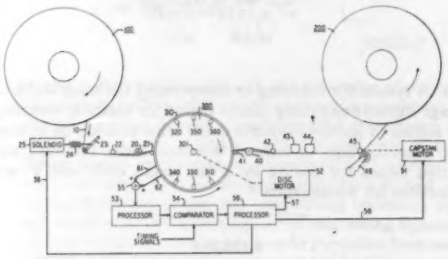
whereby fade-in recording of a sound is accompanied by simultaneous fade-out erasing of a prior recorded sound, both in response to said control signal.

4,163,262

HELICAL VIDEO TAPE RECORDER ARRANGEMENT SUITABLE FOR HIGH QUALITY EDITING

Harry Kaemmerer, Franklin Township, Somerset County, N.J., assignor to Americal Telephone and Telegraph, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,063
Int. Cl.[2] H04N *5/795;* **G11B** *27/02, 21/04, 5/52*
U.S. Cl. 360—14 **6 Claims**



1. An editing system for a helical video tape recorder having a supply and take-up arrangement for video tape capable of storing video and synchronization information on parallel diagonal tracks thereon, a rotating and slotted drum over whose surface video tape from such supply and take-up arrangement moves in its direction of rotation and within whose slot a counter-rotating disc provides support for transducer heads in contact with tape passing on the surface of such drum comprising:

at least one record-reproduce transducer head mounted on said disc for alternative recording or sensing of video information on said moving tape,

at least one synchronization-sensing transducer head mounted on said disc in advance with respect to the direction of rotation thereof of said record-reproduce transducer head for responding to synchronization information on said moving tape, and

at least one erasing transducer head mounted on said disc intermediate of said record-reproduce and synchronization-sensing heads for erasing video information to be edited out without destroying synchronization information.

4,163,263

METHOD AND APPARATUS FOR TAPE RECORDING TIME-SPACED SEGMENTS OF VIDEO INFORMATION FROM A VIDEO CAMERA

Gerhard Rotter, Mission Viejo, Calif., assignor to Basf Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,456
Int. Cl.[2] H04N *5/785, 5/04*
U.S. Cl. 360—14 **8 Claims**

1. For use in a video recorder of the longitudinal type, a method for recording sequential, time-spaced scenes of video information from a video camera on a recording tape in such a manner that the scenes may be reproduced without loss of synchronization, said method comprising the steps of:

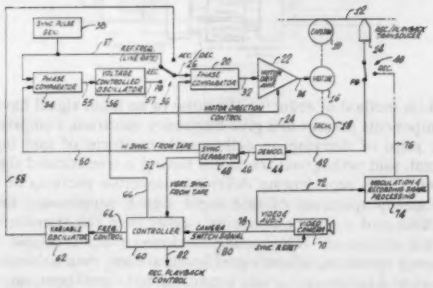
decelerating the tape to a stop after recording a scene;

backspacing the tape for a preselected time or distance;

accelerating the tape to recording speed in the original direction upon actuation of a control to begin recording the next scene;

reading synchronization signals from the tape;

synchronizing movement of the tape, as determined from the synchronization signals read therefrom, with synchronization signals associated with the video camera; and



switching the recorder to a recording mode to record the next scene;

wherein said synchronizing step includes synchronizing horizontal synchronization pulses read from the tape with horizontal synchronization pulses used to operate the camera, and resetting vertical synchronization of the camera to correspond to vertical synchronization signals read from the tape;

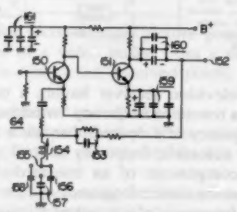
and wherein said steps of accelerating the tape, reading synchronization signals and synchronizing movement of the tape are performed with such speed as to minimize delay at the start of recording each scene.

4,163,264

NOISE IMPROVEMENT BY CAPACITOR BANK IN MAGNETIC RECORDING AND PLAYBACK APPARATUS

Kazuo Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 14, 1977, Ser. No. 768,426
Claims priority, application Japan, Feb. 13, 1976, 51-14567
Int. Cl.[2] G11B *5/02;* **H03H** *7/08*
U.S. Cl. 360—68 **9 Claims**



1. A magnetic recording and reproduction apparatus comprising:

a recording amplifier for amplifying an audio signal;

a recording magnetic head for recording an output signal from said recording amplifier on a magnetic tape;

an output circuit for coupling the output signal of said recording amplifier to said recording magnetic head;

an oscillator for supplying a high frequency bias signal to said recording magnetic head at the time of the recording;

a reproduction magnetic head for reproducing a signal recorded on the magnetic tape;

a reproduction amplifier for amplifying an output signal from said reproduction magnetic head; and

a power supply circuit for impressing a supply voltage to said recording amplifier; and

said output circuit provided with a capacitor block comprising means for reducing harmonic distortion, said means comprising a plurality of capacitors connected in parallel and having successively smaller capacitance values, with at least one of the smaller value capacitors being of the lower inner loss type;

whereby the effective internal loss of said block of capacitors is decreased and harmonic distortion reduced.

4,163,265

MAGNETIC DISC MEMORY AND MAGNETIC DISC FOR THIS MEMORY

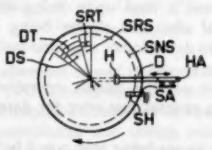
Alfred van Herk, Eindhoven, and Duco W. J. Pulle, Valkenswaard, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,273

Claims priority, application Netherlands, Mar. 10, 1977, 7702570

Int. Cl.[2] G11B *21/10, 5/12*

U.S. Cl. 360—77 **10 Claims**



1. A magnetic disc memory, comprising:

means for positioning a magnetic head on a track,

a disc sub-divided into sectors having groups of data tracks and sectors having groups of servo tracks in an alternating manner;

said servo tracks defining the data tracks which are staggered over one half track pitch with respect thereto;

each servo track containing magnetization changes serving as reference transitions for reference purposes;

said servo sectors having for each group of servo tracks, stepwise magnetization changes serving as measuring transitions from track to track formed by magnetiation changes of alternating polarity for position detection purposes;

said magnetization changes generating signals in said magnetic head;

a detection circuit receiving said signals from said magnetic head, having first means for detecting positive and negative transitions of said stepwise magnetization changes of alternate polarity and having position detection means to generate information based upon said changes of alternate polarity information with respect to a track number reached in a group;

said detection circuit having second means for detecting said reference transitions and an additional transition provided for every other servo track in the vicinity of said reference transitions;

said detection circuit generating control reference pulses which are also supplied to the said means for generating information with respect to a track number reached in a group;

an amplitude control circuit having means for providing the positioning of said magnetic head between two adjacent servo tracks.

4,163,266

MAGNETIC TAPE SCANNING ASSEMBLY FOR USE IN VIDEO TAPE RECORDER AND PLAYBACK APPARATUS

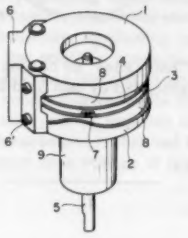
Takeo Tamamura, Hitachi; Naotatsu Asahi, Katsuta; Makoto Nakayama, Hitachi-ohta; Masataka Kasai, Mito; Akira Saito, Katsuta, and Toshimichi Terada, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1978, Ser. No. 872,454

Claims priority, application Japan, Jan. 28, 1977, 52-7773

Int. Cl.[2] G11B *5/52, 15/60, 21/18*

U.S. Cl. 360—84 **17 Claims**



1. A magnetic tape scanning assembly comprising:

(1) guiding means including a cylindrical stationary drum member for slidably guiding a magnetic tape along the smooth surface of a guiding path formed in the periphery of said drum;

(2) a rotatable magnetic head assembly including at least one magnetic head which is sightly radially protruded from the periphery of said drum and is located in a position to be in slidable contact with the surface of the magnetic tape, whereby said magnetic head scans the magnetic tape as it travels along said path;

(3) means for coaxially supporting said magnetic head assembly and guiding drum in such a manner that a small clearance is formed between the lower end of said magnetic head assembly and the upper end of said drum, whereby said magnetic head assembly rotates irrespectively of said drum;

(4) means for driving said supporting means; and

(5) wherein at least said path of said drum is made of an aluminum-silicon alloy consisting essentially of 8 to 15% by weight of silicon, 1 to 4% by weight of copper, 0.05 to 0.6% by weight of magnesium, and the balance being aluminum, an average grain size of round eutectic silicon crystals in the alloy being not larger than 5 μm, and generally continuous, fine machinning lines with a roughness of 1 to 6 μm formed on the surface of the guiding path in a direction of travel of the magnetic tape.

4,163,267

FLYING HEAD WITH COMPOUND-FOIL

Dean DeMoss, Camarillo, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 26, 1978, Ser. No. 909,793

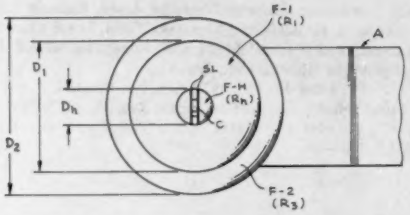
Int. Cl.[2] G11B *5/60, 15/64, 17/32*

U.S. Cl. 360—102 **12 Claims**

1. In a combined transducer-stabilizer array adapted for stabilizing and transducing passing flexible media, the combination including transducer structure disposed in a prescribed head-foil of given curvature and adapted to mount a transducer structure and to be presented in convex, "air-bearing-generating" relation with said passing media, the improvement therewith comprising:

a rigidly-fixed mounting foil arranged and adapted to sup-

port said head-foil and exhibiting a somewhat flatter convex curvature relative to said passing media so as to create



a prescribed "entry zone" air bearing film upstream of the related film generated by said head-foil.

4,163,268

CIRCUIT ARRANGEMENT FOR MONITORING READINESS FOR OPERATION OF ACTUATING DEVICES OF A SAFETY APPARATUS FOR VEHICLES

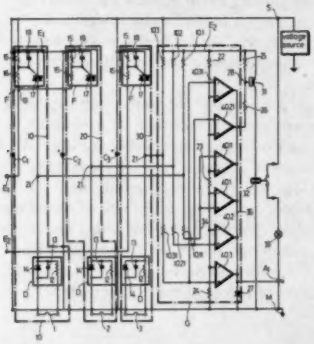
Johann Spies, Pfaffenhofen, and Alfons Wöhrl, Schrobenhausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,334

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614491

Int. Cl.[2] H02H *3/00*

U.S. Cl. 361—1 **12 Claims**



1. For a collision-sensor responsive vehicle safety device, a trigger circuit comprising: a pair of series-connected safety circuits, said pair including a safety release element and a solid switch as well as a filter for controlling the solid state switch and a Zener diode having a grounded anode, a tap connected between said safety circuits of said pair, a supplemental safety circuit connected to said tap, said supplemental safety circuit including two comparators for said release element, coupling means for coupling the voltage of the tap to the non-inverting input of the respective second comparator and the inverting input of the first comparator, and a voltage divider defining an upper and a lower reference voltage limit, said voltage divider being connected to the inverting input of the second comparator and the non-inverting input of the first comparator, connecting means connecting the outputs of the comparators in parallel for forming error signals.

4,163,269

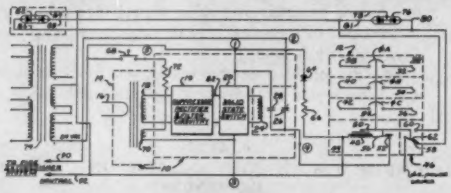
GROUND FAULT AND FIRE DETECTOR SYSTEM

William F. Helwig, Jr., Downers Grove, and Henry D. Jeffries, Jr., Brookfield, both of Ill., assignors to Avtec Industries, Inc., Downers Grove, Ill.

Filed May 6, 1977, Ser. No. 794,356

Int. Cl.[2] H02H *3/16*

U.S. Cl. 361—42 **10 Claims**



1. A ground fault and fire detector system for an A.C. electrical power distribution apparatus comprising:

circuit interrupter means having at least one pole for disconnecting an electrical load power supply from at least one load;

single-pole circuit means operatively connected to said interrupter means for controlling said interrupter means;

said single-pole means being operable to disconnect a power supply from a load upon being activated by separate sources of electrical power being imposed thereon in response to detection of a ground fault or detection of fire, respectively;

ground fault sensing means operatively positioned with respect to at least one wire for detecting a ground fault current;

said sensing means being interposed between the single-pole circuit means and a ground fault electrical power supply of less than 120 volts to control the power from the ground fault electrical power supply to the single-pole circuit means;

said sensing means including relay means responsive to detection of a ground fault current to electrically couple said ground fault power supply to the single-pole means for disconnecting said electrical load power supply from at least one load; and

said single-pole circuit means being further coupled to a fire extinguish system to supply power from a fire system electrical power supply of at least 120 volts A.C. to the single-pole circuit means for activating said interrupter means upon occurrence of a fire independently of said ground fault sensing means to disconnect said electrical load power supply from at least one load.

4,163,270

SAFETY APPARATUS FOR USE WITH A THREE-PHASE AC MOTOR

Louis J. Marus, 9151 Riverbluff Rd., Millington, Tenn. 38053

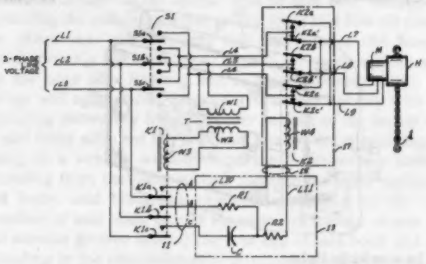
Filed Jan. 27, 1978, Ser. No. 872,886

Int. Cl.[2] H02H *3/26*

U.S. Cl. 361—77 **9 Claims**

1. Safety apparatus for use with a three-phase AC reversible direction motor, said motor providing movement of a machine in one direction or the other dependent upon the direction of motor rotation, said motor adapted to be connected to a three-phase AC power source by a three-lead wiring connection for operating said motor, said motor having a plurality of motor leads interconnected with a multiple pole motor direction control switch, said direction control switch providing selective alternate closed positions for selective reversal of the direction of said motor for selectively controlling the direction of movement of said machine by phase connection reversal, said poles of said switch being connected to said three-phase AC power source by said three-lead AC wiring connection,

said motor being adapted to operate in a correct direction if provided by AC power from said power source having a correct phase relationship and said motor being adapted to operate in an incorrect direction if provided by AC power form said power source having an incorrect phase relationship, said apparatus comprising phase detection means for detecting the phase relationship of said AC power provided by said wiring connection, said phase direction means including circuitry having three inputs respectively interconnected with the three leads of said wiring connection and having at least two outputs providing signal voltage between them having a first level indicative of a correct phase relationship provided by said wiring ocnnection but a second level indicative of said incorrect phase relationship provided by said wiring connection, a wiring connection adapted to be completed for connecting said phase detection means to said three-phase AC power source in predetermined phase connection relationship regard-



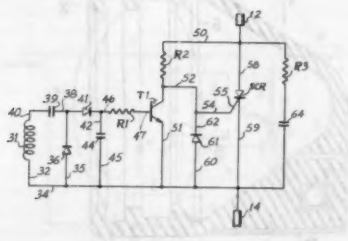
less of which of said alternate closed positions is provided by said direction control switch, relay means interconnected with sets of contacts of said direction control switch and adapted for being energized for completing said wiring connection only when said direction control switch is in one of said alternate closed positions, phase corrector means for receiving said signal voltage and comprising at least two sets of contacts interconnected with at least two of said motor leads, said sets of contacts being normally operative when said signal voltage has said first level to provide a first circuit interconnection of each of said two motor leads with a respective one of two of the leads with a respective opposite one of said two leads of said wiring connection, whereby said apparatus ensures movement of said machine in a selected direction of movement corresponding to selective operation of said direction control switch to either of said alternate closed positions regardless of any incorrect phase relationship provided by said wiring connection.

4,163,271

ELECTRONIC SWITCHING APPARATUS

James C. Sturrock, Atlanta, Ga., assignor to Michael L. Manning, Athens, Ga.

Filed Sep. 2, 1977, Ser. No. 830,089
Int. Cl.[2] H03K *17/00, 17/72*
U.S. Cl. 361—93 **3 Claims**



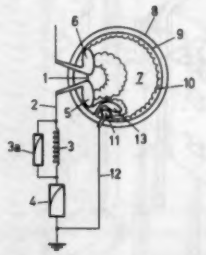
1. In a plurality of electrical circuits wherein a first circuit of said plurality of electrical circuits controls a second circuit of said plurality of electrical circuits, said second circuit having a supply voltage and a load, and switch means for selectively disconnecting said load from said second circuit, first relay means for operating said switch means for selectively disconnecting said load, and switching apparatus for operating said first relay means in response to a current in said first circuit, said switching apparatus being characterized by sensing means for sensing an electric current in said first circuit, said sensing means comprising a coil adjacent to said first circuit for having a voltage induced therein, detecting means for determining when said sensing means senses an electric current in said first circuit, first selective conducting means connected in series with said first relay means for selectively energizing said first relay means, said first selective conducting means including a gate for causing said first selective conducting means to conduct, circuit means connecting said gate to said supply voltage, and second selective conducting means for shunting said supply voltage around said gate in response to said detecting means, and further characterized in that said first relay means is constructed to operate on a voltage of approximately half said supply voltage.

4,163,272

ARRANGEMENT FOR ARC-QUENCHING IN ARRESTERS

René Rudolph, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,374
Claims priority, application Switzerland, Jan. 20, 1977, 67077/77
Int. Cl.[2] H01T *1/04*
U.S. Cl. 361—127 **9 Claims**



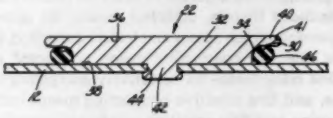
1. In an arrangement for quenching the arc formed in an arrester for the purpose of current limiting and which includes at least one device equipped with a discharge path and at least one leakage resistor, and wherein means are included for bridging the resistor with a time delay following firing of the discharge path the improvement wherein said discharge path contains at least one quenched arc gap established by a pair of spaced principal electrodes located within a quenching chamber and an associated blow-out coil for magnetically influencing the arc formed in said chamber, said quenching chamber also including an auxiliary electrode which together with the principal electrode adjacent thereto forms an auxiliary arc gap, said auxiliary electrode being connected by a conductor directly to one end of said leakage resistor, the other end of said leakage resistor being electrically connected to the said principal electrode which is adjacent said auxiliary electrode.

4,163,273

CORONA DISCHARGE APPARATUS AND METHOD HAVING MEANS FOR IMPROVED MOUNTING OF CORONA DISCHARGE WIRE

John P. Stocke, Palatine, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Aug. 1, 1977, Ser. No. 820,415
Int. Cl.[2] F24F 3/12
U.S. Cl. 361—229 7 Claims



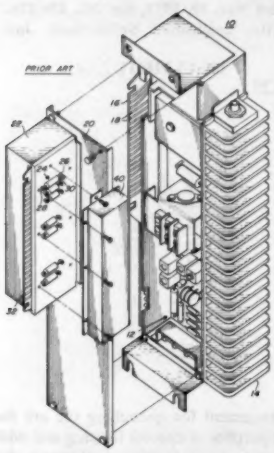
1. A corona discharge apparatus comprising: a support means, a plurality of binding posts mounted on said support means, each of said binding posts being so configured as to provide a peripheral recess, a resilient O-ring compressively retained in said recess, and a corona discharge wire extending between the binding posts and anchored thereto by being frictionally gripped between said O-ring and the surface of said recess.

4,163,274

UNIFIED CHASSIS FOR A TWO-WAY RADIO

Walter E. Carolus, Wheaton; Bryan L. Cullen, Crystal Lake, and Stanley W. Gorcik, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 688,624, May 21, 1976, abandoned.
This application Nov. 21, 1977, Ser. No. 853,160
Int. Cl.[2] H05K 5/00
U.S. Cl. 361—417 2 Claims



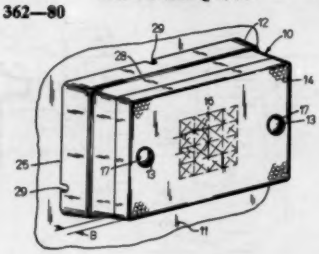
1. An electrical component chassis comprising:
a first electrical circuit structure;
a second electrical circuit structure;
electrical components for electrically intercoupling the first and second circuit structures; and
interconnect means for forming a rigid mechanical interconnection between the first and the second electrical circuit structures, said interconnect means comprising a pair of metallic "U" shaped channels, each channel having first and second end flanges and an interior curved portion, the first end flange of each "U" shaped channel being adapted to be mechanically affixed to one of the first and second electrical circuit structures, and the interior curved portion provided with means for receiving and mounting the electrical components therein; and a central circuit board structure, said central circuit board being adapted to be mechanically affixed to each "U" channel second end flange for forming a rigid mechanical interconnection between said first and second circuit structures, said central circuit board having electrical circuitry thereon for coupling signals between said first and second circuit structure.

4,163,275

CONVERTER MEANS FOR VEHICLE LIGHT

Bernard R. Weber, Elm Grove; Brian A. Hanson, Hartford, and Alton J. Cunningham, Slinger, all of Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Aug. 19, 1977, Ser. No. 826,174
Int. Cl.[2] B60Q 1/00
U.S. Cl. 362—80 11 Claims



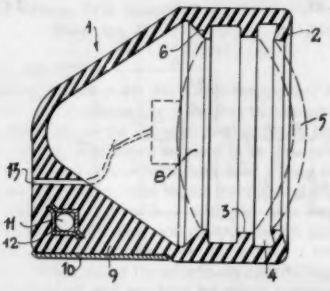
1. In a vehicle light:
a base;
first means on said base for supporting a bulb in a predetermined position relative to said base and having contact means for electrically connecting said bulb for energization from a power source remote from said base;
and converter means including an adapter assembly releasably connected to said first means in place of a bulb for supporting a bulb in a different location than said predetermined location and for electrically connecting said last-recited bulb for energization from said contact means, said adapter assembly comprising an electrically conductive support bracket engageable with said contact means and said base, a bulb socket mounted on said support bracket, and a conductor connected between said bulb socket and said contact means.

4,163,276

LIGHTING MEANS, ESPECIALLY HEADLIGHTS OF VEHICLES

Baruch Tabatchnik-Michaeli, 33 Derech Eilat, Ramat Gan, Israel

Filed Jul. 1, 1977, Ser. No. 812,044
Claims priority, application Israel, Jul. 4, 1976, 50206
Int. Cl.[2] F21M 3/14
U.S. Cl. 362—255 5 Claims



1. A casing for lighting means, especially for headlights for

vehicles, comprising a cup-shaped body arranged to receive a lighting unit and having an open front end through which the light rays are directed and a closed rear end opposite said front end and an axis extending through said body transversely of said front and rear ends, said body having a continuous annularly shaped lateral wall with an outer surface and an inner surface encircling the axis and extending between said front and rear ends, said lateral wall being closed, said body being integrally molded of a resilient elastomer, the edge of said body defining said open front end comprising an inwardly projecting annular rim completely encircling the axis of said body, a first annular rib formed in the inner surface of the lateral wall of said body completely encircling the axis thereof and spaced from said rim toward the closed rear end, the adjacent surfaces of said rim and said first rib forming a first annular groove for receiving and holding the edge of a lens to be positioned across the open front end of said body, a second annular rib formed in the inner surface of the lateral wall of said body completely encircling the axis thereof and spaced from said first rib toward the closed rear end and said first and second ribs forming therebetween a second annular groove for receiving and holding the edge of a lighting unit to be positioned within said casing, and a block-like extension formed integrally with and extending outwardly from the outer surface of the lateral wall of said body adjacent the rear end thereof for connecting the casing to a vehicle without requiring a connecting member extending from the outer surface through the inner surface of said body, said block-like extension extending in the axial direction of said body from a location rearwardly of said second annular groove toward the rear end of said body and also extending in the circumferential direction of the outer surface of said body for only an angular portion thereof.

4,163,277

SPOTLIGHT

Charles W. Altman, 5 Rudolph Ter., Yonkers, N.Y. 10701

Filed Aug. 12, 1977, Ser. No. 824,060
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—263 **5 Claims**

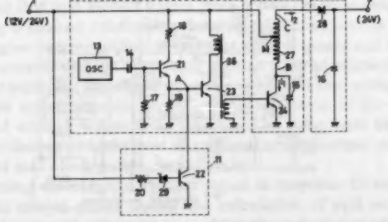
1. An axial spotlight for use with a metal halide high intensity discharge lamp having forward and rear terminals and a longitudinal axis therebetween, the invention comprising an ellipsoidal reflector having a main axis, a metal mounting frame thermally connecting said forward terminal to said reflector and means for mounting said lamp with its longitudinal axis coincident with the main axis of said reflector.

4,163,278

VOLTAGE SUPPLY CIRCUIT RESPONSIVE TO PLURAL POSSIBLE DC INPUT LEVELS

Yoshinori Onoue, Mitaka; Katsuji Matsuura, Sagamihara, and Shigenori Takahashi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,078
Claims priority, application Japan, Dec. 17, 1976, 51-152725
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—101 **10 Claims**



1. A voltage supply circuit comprising:

input means for receiving a DC input voltage having one of plural possible levels;

DC-AC inverter means for inverting said DC input voltage including a boosting transformer having at least one winding with end terminals and an intermediate terminal, and inverter drive means for providing a pulsed current to said transformer;

means connecting said input means to said intermediate terminal for applying said DC voltage to said transformer at said intermediate terminal; and

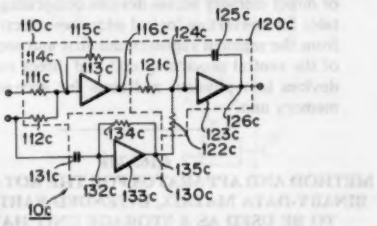
control circuit means for controlling said inverter drive means and which alterlatively selects between a first condition in which said inverter drive means is made operative and a boosted voltage is provided at one end terminal of said boosting transformer, and a second condition in which said inverter drive means is made inoperative so that said DC input voltage is provided at said end terminal, said control circuit means including level-detecting means for detecting the level of said DC input voltage and switching means selecting between said first and second conditions on the basis of the level of said DC input voltage detected by said level detecting means.

4,163,279

DERIVATIVE MINOR LOOP TYPE CONTROLLER

Tomiharu Kubota, Numazu, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 880,005
Claims priority, application Japan, Feb. 23, 1977, 52/19009
Int. Cl.[2] G06G *7/66*; G05B *11/42*
U.S. Cl. 364—105 **9 Claims**

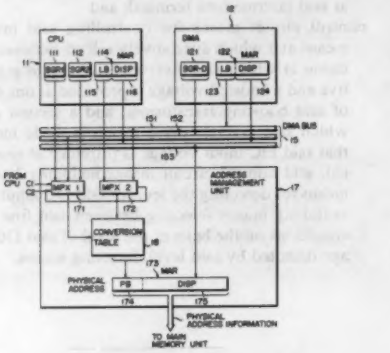


1. A controller for controlling a controlled system in connection with detecting means which detects the output of said controlled system and feeds back a corresponding detected signal to said controller such that a reference input signal to said controller and the fed-back detected signal coincide with each other, said controller comprising first amplifying means for amplifying the error between a reference input signal and the detected signal, second amplifying means for amplifying the error between the output of said first amplifying means and another signal to provide the resulting output as manipulating signal to said controlled system, and first-linear derivative amplifying means for differentiating with respect to time in a first-linear derivative manner and amplifying the detected signal to provide the resulting output as the other signal to the second amplifying means whereby, during the time when the error between the reference input signal and the magnitude of the detected and fed-back signal is relatively large, control is made such that the value of the first-linear derivative of the detected and fed-back signal is constant in an overshooting-free mode.

4,163,280
ADDRESS MANAGEMENT SYSTEM

Ryuichi Mori, Tokyo; Tadao Ichikawa, and Yukio Shiraogawa, both of Fuchu, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jun. 17, 1977, Ser. No. 807,500
Claims priority, application Japan, Jun. 30, 1976, 51-76417
Int. Cl.[2] G06F 3/00, 5/00, 9/20, 13/00
U.S. Cl. 364—200 20 Claims



1. In a data processing system comprising a main memory unit including a local and shared memory, a central processing unit for executing a program including a first register having first logical addresses and segment registers comprising segment block data for address expansion, and direct memory access devices adapted to gain direct access to the main memory unit each including a second register having second logical addresses and a segment register comprising segment block data for address expansion,

an address management unit for controlling access to either the local or shared memory by the central processing unit or direct memory access devices comprising a conversion table for converting logical addresses selectively received from the segment registers and first and second registers of the central processing unit and direct memory access devices into physical addresses for accessing the main memory unit.

4,163,281
METHOD AND APPARATUS FOR THE ROTATION OF A BINARY-DATA MATRIX, INTENDED PARTICULARLY TO BE USED AS A STORAGE UNIT HAVING A TWO-WAY ACCESS MODE FOR ELECTRONIC COMPUTERS

Luigi Stringa, Arenzano, Italy, assignor to Elettronica San Giorgio Elsag S.p.A., Genova-Sestri, Italy

Filed Sep. 29, 1977, Ser. No. 837,862
Claims priority, application Italy, Jun. 30, 1977, 25276 A/77
Int. Cl.[2] G06F 7/00
U.S. Cl. 364—200 4 Claims

2. An apparatus for rotating a binary-data matrix formed by a plurality of bit strings arranged as respective rows of the matrix, comprising:

(a) first bit-rotating means for sequentially receiving said bit strings of the matrix and rotating the bits of each string through a number of bit positions which number of bit positions increases by one from each string to the next string;

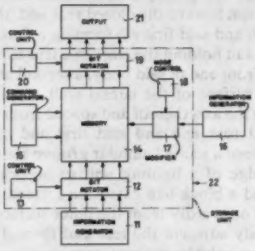
(b) a digital memory including rows and columns of individually addressable cells, a data input of said memory connected to the output of said first bit-rotating means;

(c) write and readout command generating means associated with said memory for controlling the writing of said strings having rotated bits into said memory and the reading out of modified strings of bits from said memory;

(d) address generating means associated with said memory for addressing selected cells of said memory;

(e) an address modifier interposed between said address generating means and said memory;

(f) mode control means associated with said address modifier for changing the addressing of said memory by said address modifier from a writing condition, in which all the cells of a memory row are simultaneously addressed at any write command to allow parallel writing of said strings having rotated bits in respective cell rows of the memory, to a readout condition, in which one cell of each column is addressed at any readout command to allow parallel readout of said modified strings of bits each including all the bits comprised in a respective row of a desired rotated matrix; and

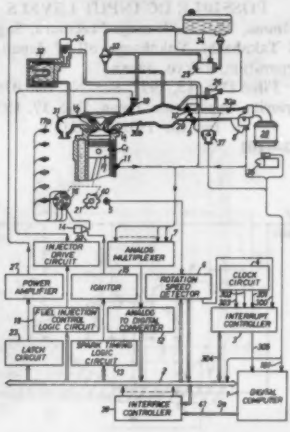


(g) second bit-rotating means for sequentially receiving said modified strings from said memory and rotating the bits of each modified string to change the sequence of said bits according to that of said respective row of the rotated matrix.

4,163,282
ELECTRICAL CONTROL METHOD AND APPARATUS FOR COMBUSTION ENGINES

Takashi Yamada, Anjo; Shinji Shirasaki, Kariya; Yukio Sakakibara, Anjo, and Hiroyasu Fukaya, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 16, 1977, Ser. No. 834,042
Claims priority, application Japan, Sep. 24, 1976, 51-115227
Int. Cl.[2] G06F 7/70; F02D 21/04
U.S. Cl. 364—431 20 Claims



1. An electrical control apparatus adapted for use with a

combustion engine having an output shaft driven by mechanical energy converted from heat energy caused by the combustion of an air-fuel mixture, said engine including first and second control means for controlling the combustion of said air-fuel mixture in accordance with changes of a condition of said engine, said apparatus comprising:

a first electrical circuit for generating an electrical signal in the form of a binary number, said signal indicating a condition of said engine as of a selected instant in time during operation of said engine;

a digital computer for repetitively and sequentially calculating first and second values corresponding to respective settings of said first and second control means by receiving therein said electrical signal, said computer being programmed to calculate said first and second values from a first function describing a desired relationship between the condition of said engine and the setting of said first control means and from a second function describing another desired relationship between the condition of said engine and the setting of said second control means;

a second electrical circuit coupled between said digital computer and said first and second control means for converting said first and second values into the settings of said first and second control means;

a detector for generating a synchronized pulse which is synchronized with and in response to the rotation of said output shaft, said computer initiating calculation of said first value in response to receipt of said synchronized pulse;

a clock circuit for generating at least one clock pulse in a predetermined time interval, said computer initiating calculation of said second value in response to receipt of said clock pulse; and

an interrupt controller for receiving said synchronized pulse and said clock pulse and for causing said computer to initiate calculation of said first value upon receiving said synchronized pulse during the calculation of said second value in said computer, and to subsequently complete the calculation of said second value after said first value has been calculated.

20. A method for controlling a combustion engine having an output shaft driven by mechanical energy converted from heat energy caused by the combustion of an air-fuel mixture, said engine including first control means for controlling the amount of air-fuel mixture metered into said engine and/or the spark-ignition timing of said engine and second control means for controlling the amount of exhaust gases recirculated from an exhaust pipe into said engine, said method comprising the steps of:

a. generating an electrical signal in the form of a binary number, said signal indicating a condition of said engine as of a selected instant in time during operation of said engine;

b. generating output pulses at a frequency proportional to the rotational speed of said output shaft to initiate the calculation of a first value;

c. generating clock pulses at a predetermined frequency, the frequency of said clock pulses being lower than that of said output pulses;

d. sequentially calculating first and second values corresponding to respective settings of said first and second control means by a computer programmed to calculate said first and second values from a first function describing a desired relationship between the condition of said engine and the setting of said first control means and from a second function describing another desired relationship between the condition of said engine and the setting of said second control means, each calculation of the first and second values being executed by using said binary number electrical signal in response to said output pulses and said clock pulses, respectively;

e. issuing an interrupt request signal in response to one of said output pulses during the calculation of said second value in said computer to prohibit the calculation of said second value in said computer and simultaneously initiate the calculation of said first value in said computer, the remainder of the prohibited calculation being executed in said computer after completion of the calculation of said first value;

f. issuing an interrupt prohibit signal during the calculation of said first value to continue the calculation of said first value in said computer;

g. converting said first and second calculated values into the settings of said first and second control means; and

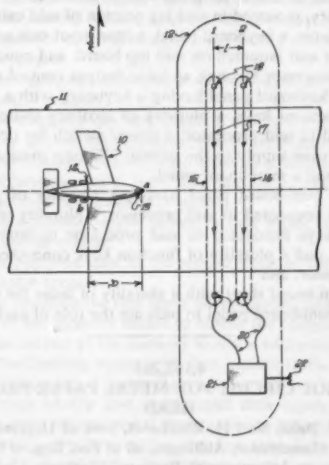
h. continuously repeating the above sequence of steps for controlling the combustion of the air-fuel mixture in response to any changes in said binary number electrical signal.

4,163,283

AUTOMATIC METHOD TO IDENTIFY AIRCRAFT TYPES

Ronald A. Darby, 256 Kuulei Rd., Kailua, Hi. 96734

Filed Apr. 11, 1977, Ser. No. 786,560
Int. Cl.[2] G01B 7/04
U.S. Cl. 364—439 **25 Claims**



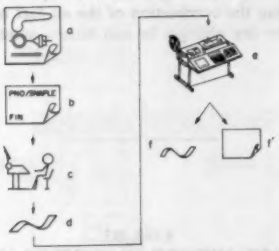
1. A method to automatically classify the type of aircraft moving on the ground by automatically determining sufficient physical characteristics unique to the landing gear of each given type of aircraft, said characteristics being the nominal major wheelbase, the total number of axles, and the spacing of the main carriage axles, comprising the steps of: providing a system comprising a sensor set, a data transmission link, a processor, and a data read-out device; said sensor set comprising two sensor systems located at a known distance apart which are activated by the wheels of the aircraft and produce a sequence of signal pulses, said data transmission link to transmit the signal pulses to the processor, said processor to generate signals representative of the type of aircraft, the location of the sensor set, the time of an event, the direction of travel of the aircraft and the speed of the aircraft in response to time intervals between signal pulses, and wheelbase characteristics from a look-up table in the memory bank of said processor, and said data read-out device to indicate the type of aircraft, the location of the sensor set, time of an event, direction of travel of the aircraft, and the speed of the aircraft.

4,163,284

NC TAPE PRODUCING SYSTEM

Hajimu Kishi; Naganori Miyoshi, and Masaki Seki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,643
Claims priority, application Japan, Sep. 10, 1976, 51-107923
Int. Cl.[2] G05B *19/42;* G06F *15/46*
U.S. Cl. 364—474 5 Claims



1. An NC tape producing system comprising

(a) a desk type cabinet having a top board and a leg portion supporting said top board,

(b) a general purpose digital processor together with a memory and an initial program loader stored in a read-only memory, mounted in said leg portion of said cabinet,

(c) a printer, a keyboard panel, a tape input unit and a tape output unit mounted on said top board, and connected to said processor through an input/output control unit,

(d) said keyboard panel having a keyboard with a plurality of character keys, a plurality of auxiliary switches connected to said processor, a power switch for controlling the power supply to the present NC tape producing system, and a mini-board panel,

(e) said mini-board panel having a plurality of guidance lamps connected to said processor, a plurality of instruction keys connected to said processor to interrupt the same, and a plurality of function keys connected to said processor, and

(f) a mini-board sheet with a plurality of holes for covering said mini-board panel to indicate the role of each key.

4,163,285

CONTROL CIRCUIT FOR METAL PAPER PRINTER HEAD

Dietrich J. Bahr; Karl H. Burckardt, both of Herrenberg, and Helmut Hasselmeier, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,392
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715889
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—710 6 Claims

1. In a printing apparatus having a plurality of activatable elements each responsive to data from a main store for recording marks along a print line in a predetermined marking row and being staggered different distances along said print line, a circuit for controlling the activation of said elements comprising:

buffer storage means having a plurality of storage cells each addressable by row and column counts;

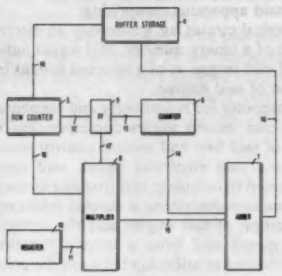
row counter means for cyclically addressing each said row of said buffer storage means; and

column means for addressing each said column in said buffer storage means, said column means including:

bistable means responsive to each cycle of said row counter for changing from one stable state to the other;

second counter means responsive to said bistable means in said one state for incrementing the count of said counter means;

multiplier means responsive to said bistable means being in one said state for forming products of a constant D and the



count of said row counter and being disabled by said bistable means being in the other said state; and

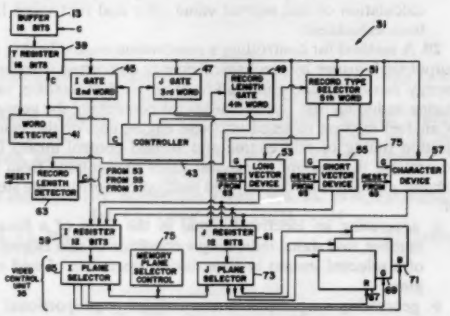
adder means for adding the output value of said second counter means and said products for addressing said buffer storage columns.

4,163,286

DIGITAL PLOTTING SYSTEM FOR DISPLAYING STRAIGHT LINE INFORMATION

Edward R. Reins, Monterey, and Charles D. B. Curry, Pacifica, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1977, Ser. No. 851,022
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—719 17 Claims



1. A digital plotting system comprising:

(a) a processor for processing a binary coded signal representing predetermined graphic information representing a straight line within a rectangular coordinate system having first and second mutually orthogonal coordinate lines and said coded signal including information defining the initial starting point, the length, the sector and the slope of said straight line;

(b) said processor including an I register for defining one coordinate of the rectangular coordinate system and a J register for defining the other coordinate of said rectangular coordinate system wherein each of said I and J registers includes increment and decrement inputs;

(c) said processor including first means operatively connected to said I and J registers for loading the initial starting point of said straight line of said predetermined graphic information in said I and J registers;

(d) said processor including second means for storing the length of said straight line of said predetermined graphic information representing a straight line;

(e) said processor including third means for sensing the particular sector of an 8 sector definition of a circle described about said initial starting point;

(f) said processor including fourth means for providing rectangular coordinate output signals that define the straight line and its slope within any one of said 8 sectors;

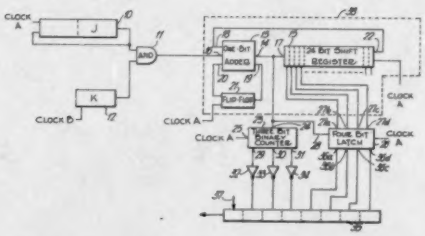
(g) the output of said second means operatively connected to said fourth means for terminating the output signal of said fourth means when the length of said line has been obtained; and

(h) said third means comprises a plurality of decoders for decoding the sector information of said coded signal and selecting the increment and decrement inputs of said I and J registers for receiving the output signals from said fourth means for plotting the straight line and its slope from only said first coordinate line or from said second coordinate line.

4,163,287
BINARY MULTIPLIER CIRCUIT INCLUDING CODING CIRCUIT

Ernst A. Munter, and Carmine A. Ciancibello, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 20, 1978, Ser. No. 898,165
Int. Cl.² G06F 7/52; H03K 13/24
U.S. Cl. 364—757 **14 Claims**



1. A multiplier circuit for multiplying a first unsigned binary number having a maximum of n binary bits by a second unsigned binary number having a maximum of m binary bits and producing an unsigned coded binary product having a maximum of q binary bits, wherein n, m and q are all positive integers, $(n+m)>q$, said multiplier circuit comprising:

an accumulator means, including a shift register having $(n+m)$ bit locations for storing both the partial products and the final non-coded product of said first and second binary numbers, said register being preset to an initial binary value;

a $(q-p)$ bit binary counter connected so as to increase its count by one, for every logic 0 input to said register, said counter being reset to zero at the occurrence of every logic 1 at the input of said register, wherein p is a positive integer, $o<p<q$;

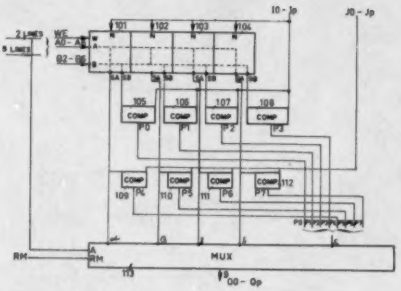
a latch circuit connected so as to receive the bits stored in the p most significant bit locations of said register, said latch circuit being responsive to the input signal to said register so as to load the bits from said register into said latch circuit at every occurrence of a logic 1 at the input to said register;

the most significant bits of said coded product being the base-minus-one complement of the final count stored in said counter, and the least significant bits of said coded product being the final binary number stored in said latch circuit.

4,163,288
ASSOCIATIVE MEMORY

Daniel Vinot, Sucy-en-Brie, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 6, 1977, Ser. No. 785,233
Claims priority, application France, Apr. 15, 1976, 76 11234
Int. Cl.² G06F 7/04; G11C 15/00
U.S. Cl. 364—900 **2 Claims**



1. An associative memory comprising:

memory means for storing a plurality of data;

first and second addressing means coupled to the memory means to address data locations in the memory means;

first comparator means having a first input, a second input, and an output;

means for applying data to the second input of the first comparator means;

means for coupling the first input of the first comparator means to the memory means to enable the comparison of the data content of the memory location addressed by the first addressing means with data applied to the second input of the first comparator means;

second comparator means having a first input, a second input, and an output;

means for applying data to the second input of the second comparator means;

means for coupling the first input of the second comparator means to the memory means to enable the comparison of the data content of the memory location addressed by the second addressing means with data applied to the second input of the second comparator means;

a multiplexer having first and second data inputs, a data output, and a control signal input, said multiplexer serving to transmit data from either the first data input or the second data input to the data output as determined by the control signal input;

means for coupling said multiplexer first data input to the memory means to receive the data content of the memory location addressed by one of the addressing means; and

means including an AND circuit for coupling said multiplexer second data input to the outputs of said comparators to receive data indicating whether there is an address conflict.

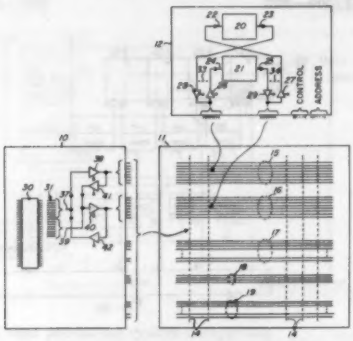
4,163,289
SIXTEEN BIT MICROCOMPUTER MEMORY BOARDS FOR USE WITH EIGHT BIT STANDARD CONNECTOR BUS

Robert W. Schmidt, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,398
Int. Cl.² G11C 13/00
U.S. Cl. 365—51 **8 Claims**

1. A microcomputer comprising: a processor board containing a microprocessor having sixteen bit bidirectional data

terminals; a sixteen bit memory board containing separate eight bit unidirectional Data In and Data Out lines; a connector board containing a standardized bus with a plurality of plug-in connectors to receive the processor board and memory boards, the connector board having separate eight bit Data In and Data Out lines for connection to said lines on the memory boards; unidirectional means on the memory board to connect



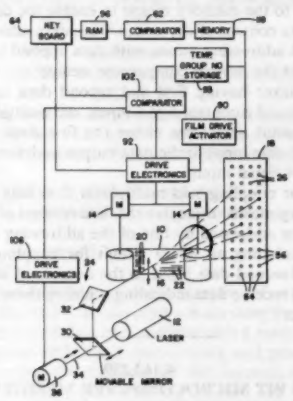
the eight bit Data In and Data Out lines to two separate memory arrays on the memory board, the unidirectional means being connected in opposite direction for one of the memory arrays relative to the other; and connecting means on the processor board to connect the sixteen bit bidirectional data terminals to the two separate eight bit Data In and Data Out lines of the connector board.

4,163,290

HOLOGRAPHIC VERIFICATION SYSTEM WITH INDEXED MEMORY

Kent K. Sutherlin, Los Altos; Ted J. Crowther, Saratoga, and Kent A. Salmond, Los Gatos, all of Calif., assignors to Optical Data System, Mountain View, Calif.

Filed Feb. 8, 1974, Ser. No. 440,897
Int. Cl.[2] G11C *13/04*
U.S. Cl. 365—125 **29 Claims**



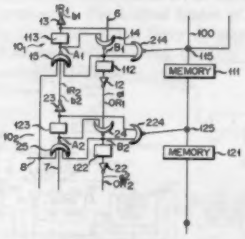
1. A binary data storage and retrieval system for the high-speed determination of the presence or absence of a given information unit comprising an elongate strip having a multiplicity of individual holograms evenly distributed over a plurality of elongate hologram channels on the strip, the holograms defining a holographic memory, each hologram being a holographic record of a binary spot pattern; a light source for generating binary spot patterns from holograms in any one of the channels by illuminating holograms belonging to such channel only; means for detecting such generated spot patterns; the strip including holographic index means identifying the holograms in each channel for selecting the channel in which the information unit would be recorded if present in the memory; means for directing light from the source to the selected channel; and advancing means cooperating with the light directing means for first searching the index, thereafter directing the light to the selected channel and thereafter reading the memory.

4,163,291

INPUT-OUTPUT CONTROL CIRCUIT FOR FIFO MEMORY

Seigo Suzuki, Yokohama, and Yoshiaki Moriya, Ingai, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Oct. 15, 1976, Ser. No. 732,965
Claims priority, application Japan, Oct. 15, 1975, 50-123235; Oct. 15, 1975, 50-123237; Nov. 18, 1975, 50-138550
Int. Cl.[2] G11C *7/00, 19/00*
U.S. Cl. 365—221 **8 Claims**



1. A memory input-output control device for controlling the read-write operation of a first-in first-out memory having a plurality of sequentially-arranged memory elements (**111, 121**), comprising an input control line (**6**); an output control line (**7**); and a plurality of data control circuit elements (10_1, 10_2) sequentially connected between the input and output control lines (**6, 7**), each of said data control circuit elements being connected to one of the plurality of sequentially-arranged memory elements and comprising a circuit having an input control signal output terminal (**a1** or **a2**) and an output control signal output terminal (**b1** or **b2**), wherein the input control line, during a write operation, is supplied with an input control pulse signal and the output control signal output terminal (**b1** or **b2**) of each of said data control circuit elements, in response to the input control pulse signal, has a binary signal representing the full or empty state of the respective memory element, and wherein the output control line, during a read operation, is supplied with an output control pulse signal and the input control signal output terminal of each of said data control circuit elements, in response to the output control pulse signal, has a binary signal representing the full or empty state of the respective memory element.

DESIGN PATENTS

GRANTED JUL. 31, 1979

ERRATA

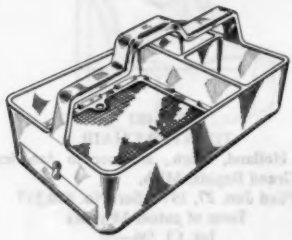
For CLASS	See PATENT NO.
D21–027	252,530
D03–074	252,535

252,476
CANDY
Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.
Filed Oct. 7, 1977, Ser. No. 840,513
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—16

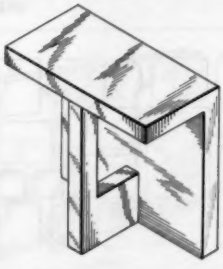
252,477
CANDY
Roy K. Wills, Jr., Oxford, Ohio, assignor to International Leisure Activities, Inc.
Filed Oct. 7, 1977, Ser. No. 840,515
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—17

252,478
CORD LEADER
C. Tom Grimes, 2615 Dean Ave., Des Moines, Iowa 50317
Filed Jan. 19, 1977, Ser. No. 760,455
Term of patent 14 years
Int. Cl. D03—*99*
U.S. Cl. D3—28

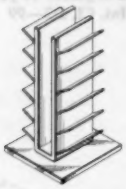
252,479
CADDY FOR NOTIONS
Jolene Goeden, 4515 Pleasant Ave. South, Minneapolis, Minn. 55409
Filed Sep. 1, 1977, Ser. No. 829,991
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—68



252,480
INVERTIBLE TABLE
Erwin J. Grauert, Yonkers, N.Y., assignor to Grauert Enterprises, Inc.
Filed Aug. 8, 1977, Ser. No. 822,783
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—3

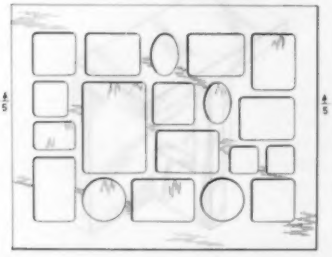


252,481
DISPLAY RACK FOR EYEGLASS CASES
Kenneth G. Gordon, 4320 Greer Rd., Woodland Hills, Calif. 91364
Filed Jul. 3, 1978, Ser. No. 921,866
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

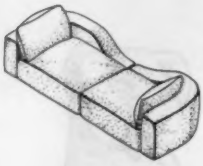


252,482
THEATER CHAIR
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Jun. 27, 1977, Ser. No. 810,117
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

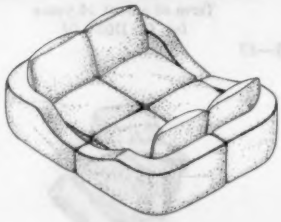
252,483
PICTURE FRAME
Vincent Lanci, 1411-116th St., and Angelo Lanci, 9-24-130th St., both of College Point, N.Y. 11356
Filed Mar. 10, 1977, Ser. No. 776,469
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



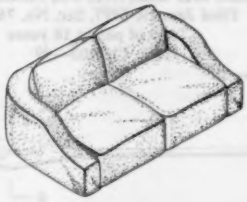
252,484
SOFA OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc., Boone, N.C.
Filed Apr. 19, 1977, Ser. No. 788,850
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



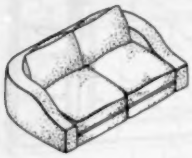
252,485
LOUNGE SEAT
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 788,841
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



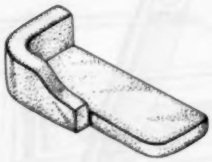
252,486
SOFA OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 788,842
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



252,487
CONVERTIBLE SOFA OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 788,843
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

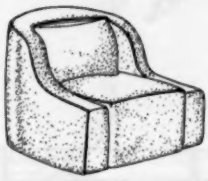


252,488
CONVERTIBLE SEAT OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 788,844
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—64

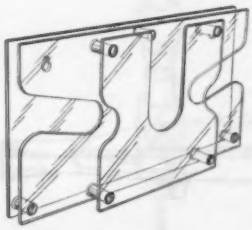


252,489
CONVERTIBLE SEAT OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 789,001
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—64

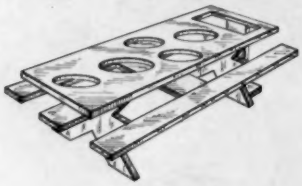
252,490
SEAT OR SIMILAR UNIT OF FURNITURE
Frank W. Petersilie, Boone, N.C., assignor to Investments & Innovative Concepts, Inc.
Filed Apr. 19, 1977, Ser. No. 788,996
The portion of the term of this patent subsequent to Jul. 31, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

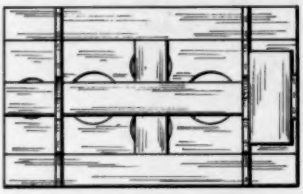


252,491
FOOD PROCESSOR TOOL HOLDER
Paul R. Hoffman, Toronto, and Hans K. Wallenwein, Thornhill, both of Canada, assignors to Plasti-Fab Co. Ltd., Markham, Canada
Filed Dec. 5, 1977, Ser. No. 857,741
Claims priority, application Canada, Jun. 10, 1977, 100677
Term of patent 14 years
Int. Cl. D6—*04*; D7—*06*
U.S. Cl. D6—130

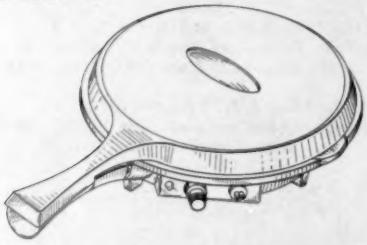


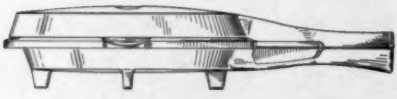
252,492
COMBINED CONDIMENT AND NAPKIN HOLDER
Delbert H. Synder, 940 Everett Rd., Fremont, Ohio 43420
Filed Mar. 9, 1977, Ser. No. 776,006
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—52



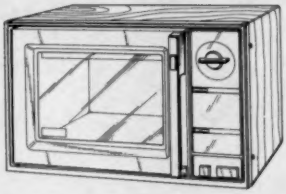


252,493
FRY PAN
George Barradas, Greenwich, Conn., assignor to SCM Corporation, New York, N.Y.
Filed Jun. 27, 1977, Ser. No. 810,236
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94





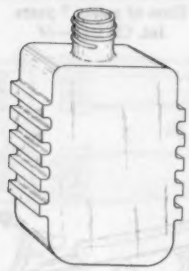
252,494
MICROWAVE OVEN
Daisaku Mori, Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 15, 1977, Ser. No. 851,656
Claims priority, application Japan, Jul. 8, 1977, 52-27008
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



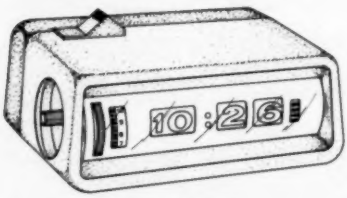
252,495
COVER FOR HANDLE OF A HAMMER
Carl-Arne Breger, Malmo, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden
Filed Mar. 18, 1977, Ser. No. 779,238
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—80

252,496
CABLE STRAP SADDLE
Richard L. Double, 1926 Roxanne Ave., Long Beach, Calif. 90813
Filed Jul. 13, 1977, Ser. No. 815,191
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

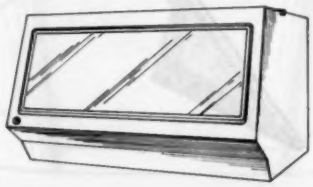
252,497
BOTTLE
André Courreges, Neuilly sur Seine, France, assignor to Piade, Paris, France
Filed Apr. 20, 1977, Ser. No. 789,122
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168



252,498
DIGITAL CLOCK
Koji Terada, 2-149-2, Kosugigoten-cho, Nakahara-ku, Kawasaki City, Kanagawa Prefecture, Japan
Filed Sep. 21, 1977, Ser. No. 835,249
Claims priority, application Japan, Mar. 3, 1977, 52-11708
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



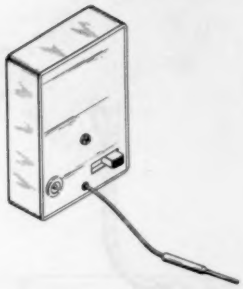
252,499
CLOCK
Ken Shimasaki, Hong Kong, Hong Kong, assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Sep. 22, 1977, Ser. No. 835,846
Claims priority, application United Kingdom, Mar. 29, 1977, 979470
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



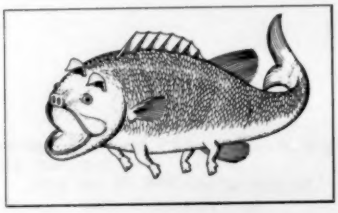
252,500
LEVELING INSTRUMENT
John F. Mason, 122 W. Second St., Pass Christian, Miss. 39571
Filed Sep. 7, 1977, Ser. No. 831,336
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

252,501
INNER DIAMETER MICROMETER
Mineo Yamauchi, and Masao Nakahara, both of Kawasaki, Japan, assignors to Mitutoyo Mfg., Co., Ltd.
Filed Feb. 22, 1978, Ser. No. 880,235
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

252,502
RECHARGEABLE BATTERY CHECKER
William T. Kelly, III, Wilton, Conn., assignor to Union Carbide Corporation, New York, N.Y.
Filed Feb. 7, 1977, Ser. No. 766,384
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77

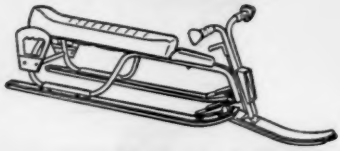


252,503
PLACARD OR THE LIKE
Alan A. Alaniz, 10531 Sagebluff, Houston, Tex. 77089
Filed Apr. 18, 1977, Ser. No. 788,240
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—134



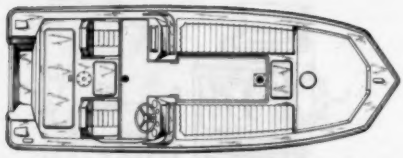
252,504
PLAQUE OR SIMILAR ARTICLE
Walter Gehrig, 1530 Lucky St., Oceanside, Calif. 92054
Filed Aug. 12, 1976, Ser. No. 713,990
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—136

252,505
SNOW SLED
Gennady G. Derkach, Timiryazevskaya ulitsa, 9, kv. 93, Moscow; Vladimir A. Kovtonjuk, Jubileiny prospekt, 74, kv. 234, Khimki Moskovskoi oblasti; Valentin A. Kuryabin, Shenkursky proezd, 6 "b", kv. 102, Moscow; Boris B. Makhonov, Putevoi proezd, 28, kv. 37, Moscow, and Lev A. Kuzmichev, Bolshaya Mariinskaya ulitsa, 7, korpus 2, kv. 39, Moscow, all of U.S.S.R.
Filed Oct. 21, 1976, Ser. No. 734,598
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D12—9



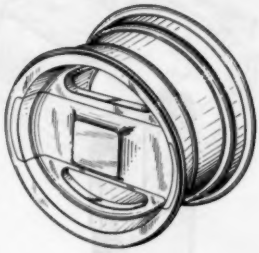
252,506
WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK
Charles J. Clark, N. 6609 Washington, Spokane, Wash. 99208
Filed Feb. 28, 1977, Ser. No. 772,512
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

252,507
COMBINATION PLEASURE AND FISHING BOAT
Forrest L. Wood, Flippin, Ark., assignor to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Feb. 23, 1977, Ser. No. 771,336
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

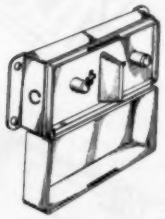


252,508
WIND DEFLECTOR
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.
Filed Nov. 14, 1977, Ser. No. 851,523
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

252,509
WHEEL
Edward A. Kozloski, Babylon, N.Y., assignor to Fiat Motors of North America, Inc., Montvale, N.J.
Division of Ser. No. 816,283, Jul. 18, 1977, Pat. No. Des. 248,849, which is a division of Ser. No. 719,721, Sep. 2, 1976, Pat. No. Des. 246,239. This application May 3, 1978, Ser. No. 902,774
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



252,510
TERMINAL FOR JUMP CABLES
Raoul G. Fima, 7454 Gaynor Ave., Van Nuys, Calif. 91406
Filed Apr. 27, 1977, Ser. No. 791,371
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13



252,511
MICROPHONE STAND
Marlin J. Genz, P.O. Box 17, Clitherall, Minn. 56524
Filed May 23, 1977, Ser. No. 799,756
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—13

252,512

CASSETTE RECORDER

Andries Van Deuren, Houthalen, Belgium, assignor to U.S. Philips Corporation, Tarrytown, N.Y.

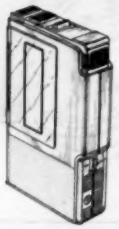
Filed May 6, 1977, Ser. No. 794,570

Claims priority, application United Kingdom, Nov. 15, 1976, 977937

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—6



252,513

PORTABLE RADIO RECEIVER

Katsuhiko Makino, Hsrakata, and Kikuo Ohta, Katoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

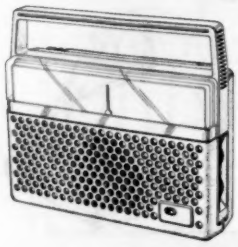
Filed Nov. 10, 1976, Ser. No. 740,459

Claims priority, application Japan, May 11, 1976, 51-17523

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



252,514

PORTABLE RADIO

Takeyoshi Kawano, Kyoto, and Munenori Fujimoto, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kasoma, Japan

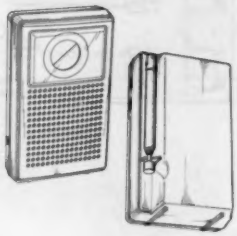
Filed Mar. 15, 1977, Ser. No. 777,979

Claims priority, application Japan, Sep. 20, 1976, 51-37491

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



252,515

FLAPPER VALVE BLADE FOR A CONCRETE PUMP OR THE LIKE

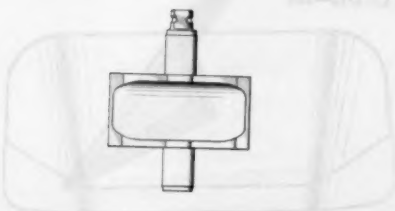
John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.

Filed May 20, 1977, Ser. No. 798,914

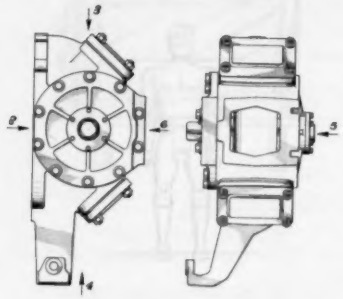
Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—7

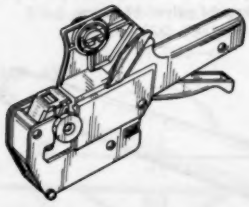


252,516
FLOW CONTROL VALVE CHAMBER FOR A CONCRETE PUMP OR THE LIKE
John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.
Filed Jun. 15, 1977, Ser. No. 806,757
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

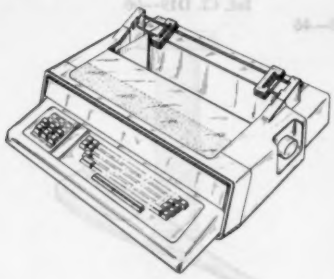


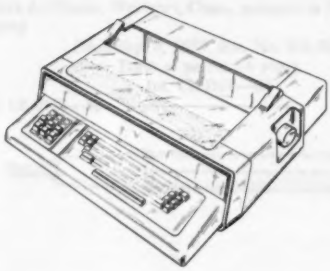
252,517
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sep. 12, 1977, Ser. No. 832,246
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

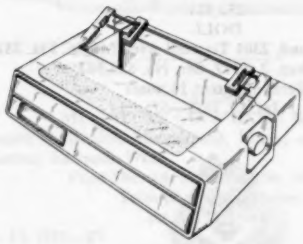
252,518
HAND OPERATED LABELING MACHINE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan
Filed Jun. 8, 1977, Ser. No. 805,624
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—14

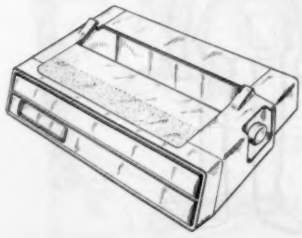


252,519
PRINTER HOUSING
David E. Roche, Nashua, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.
Filed Jan. 10, 1977, Ser. No. 758,027
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—23



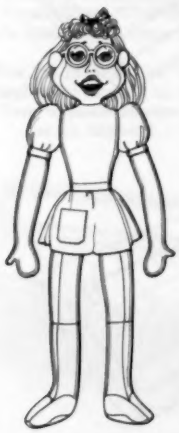




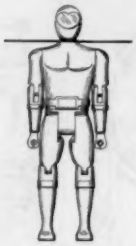


252,520
COMBINED WRITING INSTRUMENT AND CLIP FOR A GOLFER OR THE LIKE
Yasuhiro Ijiri, 454 Higashi-Okaya, Sasayama-cho, Taki-gun, Hyogo Pref., Japan
Filed Feb. 7, 1978, Ser. No. 875,939
Claims priority, application Japan, Aug. 12, 1977, 52-32213
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—46

252,521
DOLL
Thomas J. McPartland, 2301 Tigertail Ave., Miami, Fla. 33133
Filed Aug. 3, 1977, Ser. No. 821,562
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171



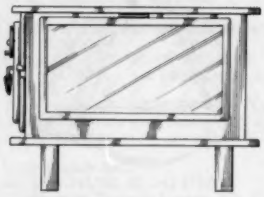
252,522
TOY SPACEMAN FIGURE
Lawrence T. Jones, Playa Del Rey, and Anson Sims, Granada Hills, both of Calif., assignors to California R & D Center, Culver City, Calif.
Filed Jan. 23, 1978, Ser. No. 871,156
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—177



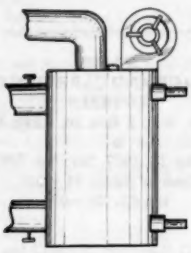
252,523
FISHING LURE BODY
Donald W. Dake, 6460 Salem Ave., Clayton, Ohio 45315
Filed Aug. 15, 1977, Ser. No. 824,989
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

252,524
LIQUID STERILIZER UNIT
James H. Lewis, 68 Glass Ave., London, Ontario, N5W 1Z7, Canada
Filed Aug. 2, 1976, Ser. No. 710,361
Claims priority, application Canada, Feb. 5, 1976, 05-02-76-2
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

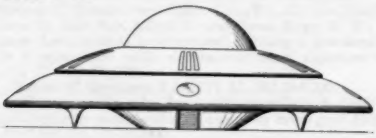
252,525
STOVE
Richard A. Russo, 31 Holiday Rd., Holbrook, Mass. 02343
Filed Apr. 18, 1977, Ser. No. 788,124
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



252,526
FURNACE
Robert G. DeNyse, 1 Edwards Ave., Calverton, N.Y. 11933
Filed Aug. 1, 1977, Ser. No. 820,948
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

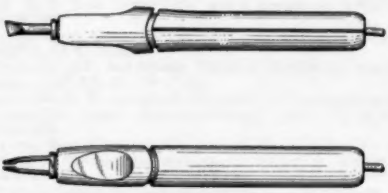


252,527
THEATER BUILDING
Terry W. Huffhines, 5300 N. Mersington, Kansas City, Mo. 64119
Filed Aug. 5, 1977, Ser. No. 822,045
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11

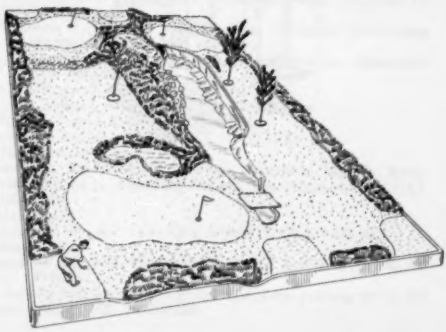


252,528
RAZOR
Russell P. Harshberger, P.O. Box 601, Pasadena, Calif. 91102
Division of Ser. No. 728,982, Oct. 4, 1976, Pat. No. Des. 250,849. This application Jun. 12, 1978, Ser. No. 915,989
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

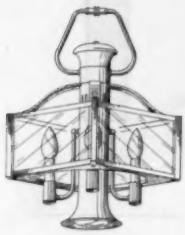
252,529
TWEEZER
Robert A. Chieda, Westport, Conn., assignor to Clairol Incorporated
Filed Sep. 8, 1977, Ser. No. 831,586
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—55



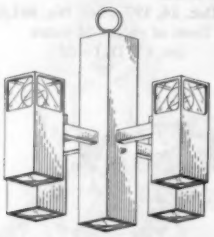
252,530
MINIATURE GOLF GAME BOARD
Bernard O. Budish, Minneapolis, Minn., assignor to Victory Games, Issaquah, Wash.
Filed Dec. 16, 1977, Ser. No. 861,434
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



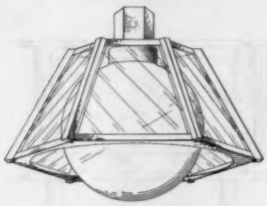
252,531
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,979
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—3



252,532
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,987
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—3

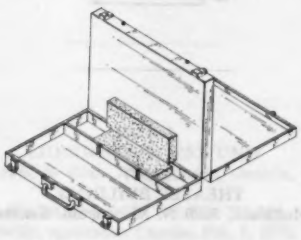


252,533
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,978
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



252,534
FLASH LIGHT CASE
Wing-Hung Lun, Chun Fat Factory Bldg. 3 Tsat Po St., Kowloon, Hong Kong
Filed Apr. 25, 1977, Ser. No. 790,802
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

252,535
COMBINED STORAGE AND CARRYING CASE FOR ART SUPPLIES
Juanita H. MacEvoy, R.R. 2 Box 16, Little Bay Rd., Wading River, N.Y. 11792
Filed May 23, 1977, Ser. No. 799,758
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See*—
Abbott, David D., 4,162,645, Cl. 86-23.000.

AB Kabi: *See*—
Aurell, Leif E.; and Claeson, Karl G., 4,162,941, Cl. 435-23.000.

AB Svenska Maskinverken: *See*—
Andersson, Sven E. A., 4,162,702, Cl. 165-142.000.

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ACF Industries, Incorporated: *See*—
Wilkins, Ronald D., 4,162,782, Cl. 251-173.000.

Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, to Windmoller & Holscher. Method and apparatus for filling and closing large sacks. 4,162,602, Cl. 53-415.000.

Adachi, Akio: *See*—
Yasuda, Katsuya; and Adachi, Akio, 4,163,224, Cl. 340-520.000.

Adams, Clair S.: *See*—
Smith, Charles A.; and Adams, Clair S., 4,162,725, Cl. 198-628.000.

Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., to Permutit Company, Inc. High velocity composite strainer. 4,162,975, Cl. 210-124.000.

Adcock, Willis A., to Texas Instruments Incorporated. Electronic photography system. 4,163,256, Cl. 358-127.000.

Addmaster Corporation: *See*—
Walker, Winston G., 4,163,161, Cl. 307-297.000.

Aeroquip Corporation: *See*—
Cox, Robert G., 4,162,802, Cl. 285-343.000.
Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., 4,162,801, Cl. 285-45.000.

AFL Industries, Inc.: *See*—
Lynch, William M., 4,162,973, Cl. 210-73.00W.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.

Agui, Takeshi: *See*—
Hisao, Nobuyoshi; and Agui, Takeshi, 4,163,260, Cl. 358-261.000.

Aisan Industry Co., Ltd.: *See*—
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Yoshimura, Noboru, 4,162,807, Cl. 297-284.000.

Aktiebolaget Atomenergi: *See*—
Bosaeus, Jan A., 4,162,703, Cl. 165-167.000.

Aktiebolaget Carl Munters: *See*—
Norback, Per, 4,162,934, Cl. 162-155.000.

Akzona Incorporated: *See*—
Spivey, Bron W., 4,162,607, Cl. 57-287.000.

Albertson, Robert V.; and Christian, Edward P. Dirty air filter indicator. 4,162,660, Cl. 116-268.000.

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Aldenhoven, Ghislanus M. A. M., to U.S. Philips Corporation. Automatic stop mechanism. 4,162,756, Cl. 226-43.000.

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Filstrup, Poul, 4,163,009, Cl. 260-112.00R.
Lidman, Sten M.; and Baum, Engelbert, 4,162,978, Cl. 210-213.000.

Alinder, Gilbert L.: *See*—
Anderson, Lloyd E.; and Alinder, Gilbert L., 4,162,809, Cl. 299-37.000.

Alkaitis, Anthony; and Cells, Paul L., to Mooney Chemicals, Inc. Oil-soluble high metal content transitional metal organic oxy, hydroxy, complexes. 4,162,986, Cl. 252-33.200.

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Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.

Allen, Norman C. Camera viewfinder. 4,162,838, Cl. 354-223.000.

Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., to Bell Telephone Laboratories, Incorporated. Defining a low-density pattern in a photoresist with an electron beam exposure system. 4,163,155, Cl. 250-492.00B.

Altman, Charles W. Spotlight. 4,163,277, Cl. 362-263.000.

Altmann, Werner, to Daimler-Benz Aktiengesellschaft. Self-locking differential gear for motor vehicles, especially bevel gear differential gear. 4,162,637, Cl. 74-711.000.

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Stocke, John P., 4,163,273, Cl. 361-229.000.

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Henningsen, Lee A.; Hare, John E.; and Amann, David J., 4,163,220, Cl. 340-331.000.

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Kaemmerer, Harry, 4,163,262, Cl. 360-14.000.

American Air Filter Company, Inc.: *See*—
Clay, Paul E.; and Floyd, James K., 4,162,904, Cl. 55-276.000.

American Cyanamid Co.: *See*—
Feeny, Richard W., 4,162,913, Cl. 71-92.000.
Lovell, James B., 4,163,102, Cl. 542-417.000.

American Hoechst Corporation: *See*—
Gillich, Thomas N., 4,162,920, Cl. 106-14.500.

American Optical Corporation: *See*—
Gee, Alan E., 4,162,830, Cl. 354-23.00R.

American Scanmec, Inc.: *See*—
Chesner, Ray J., 4,162,982, Cl. 210-486.000.

American Sterilizer Company: *See*—
Gunther, Donald A., 4,162,942, Cl. 435-17.000.

American Thread Company, The: *See*—
Westall, Thomas E.; and Miller, Frank, 4,162,600, Cl. 53-120.000.

Ameron, Inc.: *See*—
West, Robert L., 4,162,771, Cl. 242-7.220.

Amkey, Incorporated: *See*—
Gove, Donald C., 4,163,222, Cl. 340-365.00S.

AMP Incorporated: *See*—
Fleischhacker, James E., 4,162,815, Cl. 339-19.000.
Schumacher, William L., 4,162,821, Cl. 350-96.210.

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Anderson, David L., Jr. Substantially drip-proof probe for extracting toxic fluids from hermetically sealed containers. 4,162,745, Cl. 222-148.000.

Anderson, Frank. Glass sheet manufacturing method and apparatus. 4,162,907, Cl. 65-29.000.

Anderson, Lloyd E.; and Alinder, Gilbert L. Oscillating carpet and tile stripper. 4,162,809, Cl. 299-37.000.

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Andersson, Sven E. A., to AB Svenska Maskinverken. Device for dividing the flow in a heat exchanger. 4,162,702, Cl. 165-142.000.

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Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.

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Aramaki, Kazuo: *See*—
Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.

Arend, Gunter: *See*—
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.

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Arpino, Roberto. System for transmitting airport weather information. 4,163,216, Cl. 340-152.00R.

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Mikarai, Makoto, 4,162,758, Cl. 228-131.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Haragushi, Keisuke, 4,162,837, Cl. 354-173.000.

Asahi, Naotatsu: *See*—
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.

Asai, Akiji: *See*—
Thies, Peter W.; and Asai, Akiji, 4,163,055, Cl. 424-267.000.

Asai, Mitsuko: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,162,940, Cl. 435-119.000.

Asano, Seiji, to Fuji Photo Optical Co., Ltd. Data printing device for camera. 4,162,835, Cl. 354-106.000.

Asaoka, Tsutomu: *See*—
Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.

Asel, John R., to Canadian Lady-Canadelle Inc. Apparatus for hot molding of material. 4,162,885, Cl. 425-400.000.

Ashida, Itaru: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.

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Asmanes, Charles, to United States of America, Energy. Tool holder for preparation and inspection of a radiused edge cutting tool. 4,162,593, Cl. 51-218.00R.

Astarita, Emmanuel G. T-square. 4,162,578, Cl. 33-443.000.

Aubet, Philippe. Method for laying carrier cables, such as telephone lines. 4,162,865, Cl. 405-154.000.

Aubin, Michel F., to Societe d'Etudes et de Participation O.H.F. Composition active with respect to erythema solare. 4,163,049, Cl. 424-59.000.

Aurell, Leif E.; and Claeson, Karl G., to AB Kabi. Method for determining a proteolytic enzyme. 4,162,941, Cl. 435-23.000.

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Bardet, Gerard, 4,163,140, Cl. 219-10.55B.

Avon Products, Inc.: *See*—
Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., 4,163,142, Cl. 219-79.000.

Avtec Industries, Inc.: *See*—
Helwig, William F., Jr.; and Jeffries, Henry D., Jr., 4,163,269, Cl. 361-42.000.

B. F. Goodrich Company, The: *See*—
Chasar, Dwight W., 4,163,008, Cl. 260-45.85B.

Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, to Hitachi, Ltd. Protective circuit for electroacoustic transducer with hall element and voice coil temperature rise time constant circuit. 4,163,119, Cl. 179-1.00F.

Bachle, Erich; Schehrer, Rudolf; and Hoppner, Dietrich, to Licentia Patent-Verwaltungs G.m.b.H. Attenuation-free electronic switch. 4,163,159, Cl. 307-255.000.

Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, to International Business Machines Corporation. Control circuit for metal paper printer head. 4,163,285, Cl. 364-710.000.

Baker International Corporation: *See*—
Howard, Clayton L., 4,162,629, Cl. 73-141.00R.

Baldwin, Roger A., to Kerr-McGee Corporation. Process for the discharge of ash concentrate from a coal deashing system. 4,162,958, Cl. 208-8.0LE.

Ball Corporation: *See*—
Lining, Kurt; and Wood, Charles L., 4,162,910, Cl. 65-163.000.

Ballas, George C., to Weed Eater, Inc. Rotary cutting assembly. 4,162,575, Cl. 30-347.000.

Banks, Donald S.: *See*—
Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.

Banque de France: *See*—
Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.

Banucci, Eugene G.; and Boldebuck, Edith M., to General Electric Company. Novel polyetheramide-imide phenolic resin blends. 4,163,030, Cl. 525-429.000.

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Bareis, Alfred: *See*—
Dangelmaier, Karl; and Bareis, Alfred, 4,162,734, Cl. 414-27.000.

Barker, Brynley M.: *See*—
Barker, Robert J.; and Barker, Brynley M., 4,162,744, Cl. 221-251.000.

Barker, Robert J.; and Barker, Brynley M. Seed dispensing device. 4,162,744, Cl. 221-251.000.

Barron, Daniel. Acousto-optical device for removing bubble pulse from reflected sonar signal. 4,163,205, Cl. 340-7.00R.

Bartolomei, Giuseppe. Packaging machines using retractile thermoplastic film. 4,162,604, Cl. 53-557.000.

Barton, Donald W.: *See*—
Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.

Barzynski, Helmut: *See*—
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.

BASF Aktiengesellschaft: *See*—
Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.
Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
Rotter, Gerhard, 4,163,263, Cl. 360-14.000.

BASF Wyandotte Corporation: *See*—
Narayan, Thirumurti; and Cenker, Moses, 4,163,086, Cl. 521-155.000.

Bassett, William W.; and Johnson, Eugene D., to Honeywell Inc. Agitation apparatus. 4,162,856, Cl. 366-213.000.

Bath-Ladd Corporation: *See*—
Freeman, Joseph T.; and Colish, Aaron, 4,162,544, Cl. 4-185.00H.

Batzer, Hans: *See*—
Buxbaum, Lothar; Habermeier, Jurgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.

Bauer, Frank: *See*—
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.

Baum, Engelbert: *See*—
Lidman, Sten M.; and Baum, Engelbert, 4,162,978, Cl. 210-213.000.

Bauman, Marcus: *See*—
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.

Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., to Ciba-Geigy Corporation. Crosslinkable polymeric compounds. 4,163,097, Cl. 525-531.000.

Baumwolspiner, Milton, to Bell Telephone Laboratories, Incorporated. Voice synthesizer. 4,163,120, Cl. 179-1.0SM.

Baxter Travenol Laboratories, Inc.: *See*—
Pernic, Stanley J., 4,162,974, Cl. 210-120.000.

Bayer Aktiengesellschaft: *See*—
Bier, Peter; and Binsack, Rudolf, 4,163,100, Cl. 525-3.000.
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
Hess, Bernhard; and Kraft, Klaus, 4,163,093, Cl. 528-301.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.
Klein, Johann, 4,162,674, Cl. 128-680.000.
Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.
Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
Pettelkau, Hans-Jurgen; and Hohmann, Gerhard, 4,163,091, Cl. 526-208.000.
Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.
Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.
Ullrich, Martin, 4,162,854, Cl. 366-83.000.
Zlokarnik, Marko, 4,162,970, Cl. 210-15.000.
Zlokarnik, Marko; and Elgeti, Klaus, 4,162,971, Cl. 210-15.000.

Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., to Hughes Aircraft Company. Separated ion source. 4,163,151, Cl. 250-296.000.

BBC Brown, Boveri & Company Limited: *See*—
Rudolph, Rene, 4,163,272, Cl. 361-127.000.

Beafore, Frank J., to Dow Chemical Company, The. Method for facilitating transportation of particulate on a conveyor belt in a cold environment. 4,163,079, Cl. 428-411.000.

Beauregard, Andree. Loom for high warp tapestry. 4,162,562, Cl. 28-151.000.

Becker, Harold D., to Calspan Corporation. Continuous-wave range measurement apparatus. 4,163,233, Cl. 343-12.00R.

Becker, William D.: *See*—
Brodsky, Harvey A.; and Becker, William D., 4,163,123, Cl. 179-15.0AL.

Beckman, John H., to Union Carbide Corporation. Reversible shirred casing and method for producing it. 4,162,693, Cl. 138-118.100.

Bedue, Jean R.: *See*—
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Beebe, Burke A.: *See*—
Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.

Beecham Group Limited: *See*—
Box, Stephen J.; and Hood, John D., 4,163,051, Cl. 424-124.000.

Beentjes, Gerardus: *See*—
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.

Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., to Lever Brothers Company. Prostaglandins. 4,163,108, Cl. 560-121.000.

Behrenz, Wolfgang: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.

Belcher, John A., to United States Steel Corporation. Spotting method and apparatus for coke oven batteries. 4,162,944, Cl. 201-41.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., 4,163,155, Cl. 250-492.00B.
Baumwolspiner, Milton, 4,163,120, Cl. 179-1.0SM.
Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.
Soos, Nicholas A., 4,163,072, Cl. 427-96.000.

Bemish, Timothy A.: *See*—
Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.

Bender, Charles E., to Spectroderm International, Inc. Magnetic stirrer apparatus. 4,162,855, Cl. 366-274.000.
Bendix Corporation, The: *See—*
Kosakowski, Henry R., 4,163,221, Cl. 340-347.0AD.
Bennett, Robert A., to Risdon Manufacturing Company. Squeezable dispenser with outlet closure. 4,162,749, Cl. 222-633.000.
Bennett, Robert S., to Risdon Manufacturing Company. Dispenser using belleville diaphragm. 4,162,748, Cl. 222-632.000.
Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., to United States of America, Navy. Radar signal simulator. 4,163,234, Cl. 343-17.700.
Bentz, Francis: *See—*
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.
Berit, Bradley I., to De Laval Separator Company, The. Load indicator for centrifuges. 4,162,980, Cl. 210-360.00R.
Berit, Bradley I., to De Laval Separator Company, The. Discharger for centrifuges. 4,162,981, Cl. 210-375.000.
Bernert, Claus-Rudiger: *See—*
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.
Berning, David W. Audio amplifier. 4,163,198, Cl. 330-277.000.
Bessone, Carlo S.: *See—*
Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.
Bianchi, Giuseppe: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, 4,162,953, Cl. 204-252.000.
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Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.
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Bier, Peter; and Binsack, Rudolf, 4,163,100, Cl. 525-3.000.
Bishop, James S.: *See—*
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.
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Reifers, Richard F.; and Bixler, Kenneth D., 4,162,759, Cl. 229-2.50R.
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Mistry, Kantilal; and Sperber, Martin, 4,163,252, Cl. 358-118.000.
Bloom Engineering Company, Inc.: *See—*
Hirose, Yasuo, 4,162,890, Cl. 431-351.000.
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Antonsen, Stephen A.; and Boaz, David P., 4,163,077, Cl. 428-355.000.
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Huber, Bernhard W., 4,162,849, Cl. 356-36.000.
Bodin, Leslie J.; and Marino, Francis C., to Burroughs Corporation. Composite symbol display apparatus. 4,163,229, Cl. 340-745.000.
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Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., 4,162,979, Cl. 210-282.000.
Boeing Company, The: *See—*
Fitzsimmons, George W., 4,163,232, Cl. 343-6.80R.
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Marien, Pieter; Boersma, Rintje; and Irik, Gijsbert W., 4,163,118, Cl. 174-99.00B.
Bohemen, John, to British Petroleum Company Limited, The. Blends containing elastomers. 4,162,999, Cl. 260-28.50B.
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Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.
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Banucci, Eugene G.; and Boldebuck, Edith M., 4,163,030, Cl. 525-429.000.
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Novel derivatives of 9-substituted phenyl-3,7-dimethylnona-2,4,6,8-tetraene. 4,163,103, Cl. 542-427.000.
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Carumpalos, Constantine G.; and Pansing, Harry E., 4,163,001, Cl. 260-29.6MN.
Bosaeus, Jan A., to Aktiebolaget Atomenergi. Plate-type heat exchanger. 4,162,703, Cl. 165-167.000.
Bosch Siemens Hausgerate GmbH: *See—*
Farber, Karl-Heinz, 4,163,181, Cl. 318-245.000.
Graf, Richard, 4,162,747, Cl. 222-185.000.
Bott, John A. Luggage carrier assembly. 4,162,755, Cl. 224-326.000.
Boulanger, Henry J., to Texas Instruments Incorporated. Pushbutton keyboard system. 4,163,125, Cl. 200-5.00A.
Bould, Fred, to Westinghouse Electric Corp. Circuit breaker apparatus including jack shaft support. 4,163,133, Cl. 200-153.0SC.
Bowers, George W., to Verbatim Corporation. Belt drive cartridge. 4,162,774, Cl. 242-192.000.
Bowmar Instrument Corporation: *See—*
Harden, Phillip L., 4,163,138, Cl. 200-310.000.
Box, Stephen J.; and Hood, John D., to Beecham Group Limited. Streptomycetal antibiotic. 4,163,051, Cl. 424-124.000.
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, to DeKalb AgResearch, Inc. Heat producing device. 4,162,655, Cl. 110-212.000.
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Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.
Brandenburg, Klaus, to U.S. Philips Corporation. Stylus printer impact energy control. 4,162,858, Cl. 400-124.000.
Brandes, Wilhelm: *See—*
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
Brandon, Fred Y., to International Business Machines Corporation. Hot roll fuser early closure inhibitor. 4,162,847, Cl. 355-14.000.
Brauer, Walter H.: *See—*
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.
Briggs, Albert T.: *See—*
Decima, Elmer E.; and Briggs, Albert T., 4,162,626, Cl. 72-238.000.
Briggs, Barry D.; and Lawter, Ray L., to NCR Corporation. Electrical connector. 4,162,817, Cl. 339-75.0MP.
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Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.
British Petroleum Company Limited, The: *See—*
Bohemen, John, 4,162,999, Cl. 260-28.50B.
British Railways Board: *See—*
Wickens, Alan H., 4,162,653, Cl. 105-166.000.
Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. Heterocyclic containing hydrazinecarbothioamides. 4,163,104, Cl. 544-160.000.
Brodsky, Harvey A.; and Becker, William D. Electronic tour guide system. 4,163,123, Cl. 179-15.0AL.
Brokmeier, Dieter: *See—*
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.
Brooks, Cletus A., to Selective Feeder Company. Animal feeder using magnetically biased switch. 4,162,683, Cl. 119-51.00R.
Brown, Jack: *See—*
Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.
Brown, William R. Necktie hanger. 4,162,753, Cl. 223-85.000.
Browne, Hubbard P.: *See—*
Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D., 4,162,868, Cl. 414-9.000.
Bruno, Patrick J. Tooth cleaner. 4,162,553, Cl. 15-167.00R.
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokieki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, to Politechnika Warszawska. Method for production of new thermal and chemical resistant polyurethane plastics. 4,163,087, Cl. 521-176.000.
Buckeye Molding Company: *See—*
Allen, David O., 4,162,601, Cl. 53-292.000.
Budrose, Charles R., to Upaya, Inc. Safety jumper cables. 4,163,134, Cl. 200-157.000.
Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., to Excellon Industries. Pattern recognition system. 4,163,212, Cl. 340-146.30H.
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, to Henkel Kommanditgesellschaft auf Aktien. Process for dyeing human hair with diazo salts. 4,162,893, Cl. 8-10.100.
Bullock, Michael K., to International Business Machines Corporation. Job separation by a skewed trough in the paper path. 4,162,786, Cl. 271-64.000.
Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-2,2-difluoro-PGE compounds. 4,163,110, Cl. 560-121.000.
Burckardt, Karl H.: *See—*
Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.
Burke, Richard M. Bookmark. 4,162,659, Cl. 116-234.000.
Burke, Robert: *See—*
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.
Burnham Corporation: *See—*
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.
Burroughs Corporation: *See—*
Bodin, Leslie J.; and Marino, Francis C., 4,163,229, Cl. 340-745.000.
DeMoss, Dean, 4,163,267, Cl. 360-102.000.
Wu, Alexander C., 4,162,842, Cl. 355-3.0DD.
Burynin, Vitaly A.: *See—*
Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.
Bush Universal, Inc.: *See—*
Darrin, John W., 4,162,583, Cl. 36-76.00R.

Butler, Joe D.: *See*—
Heitman, Marshall D.; and Butler, Joe D., 4,162,713, Cl. 180-242.000.
Butler, Ronald N.: *See*—
Groombridge, Frederick W. H.; and Butler, Ronald N., 4,162,548, Cl. 4-300.000.
Buxbaum, Lothar; Habermeier, Jurgen; and Batzer, Hans, to Ciba-Geigy Corporation. Polyesters prepared from NH containing carboxylic acids. 4,163,099, Cl. 528-172.000.
Buzio, Pierpaolo; and Edefonti, Lucio, to Societa' Italiana Resine S.I.R. S.p.A. Flexible double-layer polypropylene laminates for the packaging of food products. 4,163,080, Cl. 428-424.000.
C. A. Pemberton & Co. Limited: *See*—
Kyle, Rhoden R., 4,162,599, Cl. 53-77.000.
Cadillac Gage Company: *See*—
Jackson, Theodore A., 4,162,555, Cl. 15-250.010.
Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., to Carando Machine Works. Dual cutter boring head. 4,162,867, Cl. 408-157.000.
Caldwell, Oscar D. Method for ameliorating hazardous conditions associated with containers which contain vapors of combustible liquid. 4,162,694, Cl. 141-1.000.
California Institute of Technology: *See*—
Ross, Ronald G., 4,163,194, Cl. 324-29.500.
Calspan Corporation: *See*—
Becker, Harold D., 4,163,233, Cl. 343-12.00R.
Treanor, Charles E., 4,163,199, Cl. 331-94.50G.
Cambiaso, Cesar L.; and Masson, Pierre L., to Technicon Instruments Corporation. Mouse serum. 4,162,895, Cl. 435-7.00B.
Campbell, Bruce D.; and Lopez, Eugene F., to Raychem Corporation. Heat-recoverable articles and their use. 4,163,117, Cl. 174-74.00A.
Camsco, Inc.: *See*—
Higgins, Bobby L., 4,162,763, Cl. 239-101.000.
Canadian Industries Limited: *See*—
Hine, Kenneth E., 4,162,949, Cl. 204-140.000.
Canadian Lady-Canadelle Inc.: *See*—
Asel, John R., 4,162,885, Cl. 425-400.000.
Canaris, Valerie M., to R. O. Hull & Company, Inc. Acid zinc plating baths and methods for electrodepositing bright zinc deposits. 4,162,947, Cl. 204-55.00R.
Cannon, Joseph G.; and Long, John P., to University of Iowa Research Foundation. Aminotetralin adrenergic β-agonists. 4,163,063, Cl. 424-330.000.
Canon Kabushiki Kaisha: *See*—
Ito, Yuji, 4,162,827, Cl. 351-7.000.
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.
Shirahase, Reiji; and Komori, Shigehiro, 4,162,787, Cl. 271-173.000.
Tanikoshi, Kinji, 4,163,182, Cl. 318-331.000.
Capintec Inc.: *See*—
Suzuki, Arata, 4,163,152, Cl. 250-374.000.
Capuano, Italo A., to Olin Corporation. Method of measuring nitrogen trichloride in a process for the safe production of polychloroisocyanurates. 4,162,897, Cl. 23-232.00C.
Carando Machine Works: *See*—
Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.
Cardenas, Ricardo L.: *See*—
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,162,989, Cl. 252-312.000.
Carlin, Joseph T.: *See*—
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Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., to Motorola, Inc. Unified chassis for a two-way radio. 4,163,274, Cl. 361-417.000.
Carrcraft Manufacturing Company: *See*—
Shortell, Kenneth R., 4,162,546, Cl. 4-191.000.
Carter, David L., to Texas Instruments Incorporated. Second level phase lines for CCD line imager. 4,163,239, Cl. 357-24.000.
Carter, Lemuel, Jr.: *See*—
Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr., 4,162,650, Cl. 99-419.000.
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Combustion chamber for turbo engines. 4,162,611, Cl. 60-39.650.
Carumpalos, Constantine G.; and Pansing, Harry E., to Borden, Inc. Water base flexographic dye ink. 4,163,001, Cl. 260-29.6MN.
Case Western Reserve University: *See*—
Warren, Kenneth S., 4,162,850, Cl. 356-38.000.
Caterpillar Tractor Co.: *See*—
Grooss, Frank A.; and Simmons, Gerald P., 4,162,872, Cl. 414-713.000.
Trittipoe, Jack H., 4,162,570, Cl. 29-427.000.
Cecchi, Carlo: *See*—
Grattapaglia, Giorgio; and Cecchi, Carlo, 4,162,615, Cl. 60-478.000.
Celanese Corporation: *See*—
Groombridge, Frederick W. H.; and Butler, Ronald N., 4,162,548, Cl. 4-300.000.
Hannon, Martin J.; and Forschirm, Alex S., 4,163,031, Cl. 525-5.000.
Cells, Paul L.: *See*—
Alkaitis, Anthony; and Cells, Paul L., 4,162,986, Cl. 252-33.200.
Cenker, Moses: *See*—
Narayan, Thirumurti; and Cenker, Moses, 4,163,086, Cl. 521-155.000.
Central Glass Company, Limited: *See*—
Yagii, Kiyoshi; and Oshio, Hideki, 4,162,948, Cl. 204-80.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Mairy, Bernard G., 4,162,699, Cl. 164-4.000.
Cha, Chang Y., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an oil shale retort by monitoring pressure drop across the retort. 4,162,706, Cl. 166-251.000.
Chang, Richard S.; and Klose, George J., to Mattel, Inc. Obstacle game. 4,162,792, Cl. 273-85.00G.
Chapman, James W.: *See*—
Van der Beck, Roland R.; and Chapman, James W., 4,162,826, Cl. 350-319.000.
Charles, Paul A. S.; and Williams, Frederic D. M., to Royal Flush (1979) Inc. Filtering elements. 4,162,549, Cl. 4-318.000.
Charudattan, Raghavan, to Charudattan, Raghavan. Composition and process for controlling milkweed vine. 4,162,912, Cl. 71-79.000.
Chasar, Dwight W., to B. F. Goodrich Company, The. Dual purpose stabilizer compounds and polymer compositions containing same. 4,163,008, Cl. 260-45.85B.
Chenard, Jean-Yves: *See*—
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
Chertok, Allan, to Concord Computing Corporation. Document printer. 4,162,651, Cl. 101-287.000.
Chesner, Ray J., to American Scanmec, Inc. Vacuum filter segment with replaceable sector plates. 4,162,982, Cl. 210-486.000.
Chevron Research Company: *See*—
Stangeland, Bruce E., 4,162,962, Cl. 208-58.000.
Chinon Industries Incorporated: *See*—
Ito, Isami, 4,163,261, Cl. 360-13.000.
Cho, Yush-Chye. Safety folding chair. 4,162,806, Cl. 297-19.000.
Chomicz, Danuta: *See*—
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokieki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.
Christian, Edward P.: *See*—
Albertson, Robert V.; and Christian, Edward P., 4,162,660, Cl. 116-268.000.
Christy, Donald. Solar energy panel and medium for use therein. 4,162,671, Cl. 126-400.000.
Ciancibello, Carmine A.: *See*—
Munter, Ernst A.; and Ciancibello, Carmine A., 4,163,287, Cl. 364-757.000.
Ciba-Geigy Corporation: *See*—
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.
Buxbaum, Lothar; Habermeier, Jurgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.
Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.
Kristiansen, Odd; and Durr, Dieter, 4,163,056, Cl. 424-324.000.
Lind, Hanns; and Moser, Paul, 4,163,007, Cl. 260-45.75R.
Seiz, Wolfgang; and Moser, Roland, 4,163,096, Cl. 528-69.000.
Spivack, John D., 4,163,006, Cl. 260-45.8NT.
Zondler, Helmut; and Schneider, Wolfgang, 4,163,098, Cl. 528-99.000.
Cilek, Eugene T.: *See*—
Cilek, Wallace F., 4,163,065, Cl. 426-94.000.
Cilek, Gregory J.: *See*—
Cilek, Wallace F., 4,163,065, Cl. 426-94.000.
Cilek, Wallace F., to Cilek, Eugene T.; and Cilek, Gregory J., part interest to each. Edible interlocked components for ceremonial ingestion. 4,163,065, Cl. 426-94.000.
Citizen Watch Co. Ltd.: *See*—
Konii, Tsuyoshi, 4,163,230, Cl. 340-765.000.
Claeson, Karl G.: *See*—
Aurell, Leif E.; and Claeson, Karl G., 4,162,941, Cl. 435-23.000.
Clapper, Thomas W., to Kerr-McGee Corporation. Process for the removal of solid particulate materials from crude shale oils. 4,162,965, Cl. 208-177.000.
Clark, Michael T.; and ten Haken, Pieter, to Shell Oil Company. Fungicidal benzaldehyde-N-formyl-phenylhydrazones. 4,163,062, Cl. 424-324.000.
Clay, Paul E.; and Floyd, James K., to American Air Filter Company, Inc. Silencer-separator device. 4,162,904, Cl. 55-276.000.
Clews, K. Malcolm: *See*—
Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.
Clive-Smith, Martin, to Sea Containers, Ltd. Collapsible container. 4,162,737, Cl. 220-1.500.
Close, Joseph B., Jr. Electrical box seal construction. 4,163,137, Cl. 200-302.000.
Cluett, Peabody & Co., Inc.: *See*—
Lawrence, Jackson; and Cramer, Robert S., 4,162,563, Cl. 28-163.000.
Cobb, Raymond L., to Phillips Petroleum Company. 3,4,5,6-Tetrahydropyromellitdiimides. 4,163,014, Cl. 260-326.00C.
Cobbs, Walter H., Jr.; and Stewart, Martin J., to Nordson Corporation. Plastic scrap recovery apparatus. 4,162,880, Cl. 425-202.000.
Coburn, Robert E., to Molins Machine Company, Inc. Head locking means for automatic slitter scorer. 4,162,643, Cl. 83-499.000.
Coch, Lester, to Waldes Kohinoor, Inc. Non-polluting system for metal surface treatments. 4,162,680, Cl. 118-76.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of 2,6,10-trimethyl-undecan-1-ol. 4,163,021, Cl. 260-456.00P.

Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., to GTE Sylvania Incorporated. Energy saving fluorescent lamp. 4,163,176, Cl. 315-53.000.

Cojafex B.V.: *See*—
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.

Colish, Aaron: *See*—
Freeman, Joseph T.; and Colish, Aaron, 4,162,544, Cl. 4-185.00H.

Combustion Engineering Inc.: *See*—
Enegess, David N., 4,162,901, Cl. 55-17.000.

Combustion Service and Equipment Corporation: *See*—
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines: *See*—
Serrano, Francisco de Assis Manuel, 4,162,551, Cl. 14-69.500.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Giraud, Georges M., 4,163,210, Cl. 340-146.10E.
Vinot, Daniel, 4,163,288, Cl. 364-900.000.

Concord Computing Corporation: *See*—
Chertok, Allan, 4,162,651, Cl. 101-287.000.

Continental Oil Company: *See*—
Gorin, Everett, 4,162,963, Cl. 208-108.000.

Cook, Gerald H.; and Ruck, Bernard W., to Polaroid Corporation. Photographic film drive system employing inertia dumper/energy dissipater. 4,162,829, Cl. 352-166.000.

Cook, Ronald F.: *See*—
Garbero, James; and Cook, Ronald F., 4,162,814, Cl. 312-223.000.

Cooper Laboratories, Inc.: *See*—
Diamond, Julius, 4,163,022, Cl. 260-553.00R.

Copal Company Limited: *See*—
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.

Coq B.V.: *See*—
Marien, Pieter; Boersma, Rintje; and Irik, Gijsbert W., 4,163,118, Cl. 174-99.00B.

Corbellini, Glauco. Water-removal blade for paper-making machines. 4,162,937, Cl. 162-352.000.

Corbett, Constance R.: *See*—
Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.

Cornelius, Gordon. Trailer drive apparatus. 4,162,711, Cl. 180-13.000.

Correll, Richard R. Safety interlock system for fire truck pump throttle control. 4,162,714, Cl. 180-53.00R.

Corrieri, Guglielmo: *See*—
Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.

Cosman, Michael A. Pendulum drawing machine. 4,162,577, Cl. 33-27.00L.

Coughenour, Donald J.; Brown, Jack; and Herr, John A., to Singer Company, The. Sewing machine bobbin thread run-out alarm using reflected light. 4,163,158, Cl. 250-561.000.

Coulombe, George. Automatic releasing seat belt. 4,162,715, Cl. 280-801.000.

Cox, Robert G., to Aeroquip Corporation. Permanent flareless tube connector. 4,162,802, Cl. 285-343.000.

Cramer, Robert S.: *See*—
Lawrence, Jackson; and Cramer, Robert S., 4,162,563, Cl. 28-163.000.

Cremer, George D., to International Harvester Company. Processes for making hollow metal microballoons and the products thereof. 4,162,914, Cl. 75-0.50B.

Crist, V. William, Jr. Electric fence cable assembly. 4,162,783, Cl. 256-10.000.

Crowther, Ted J.: *See*—
Sutherlin, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.

Cudzik, Daniel F., to Reynolds Metals Company. Tab system. 4,162,743, Cl. 220-270.000.

Cullen, Bryan L.: *See*—
Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.

Culmer, Daniel D., to National Semiconductor Corporation. System for establishing and steering a precise current. 4,163,188, Cl. 323-4.000.

Cummings, Gary J., to Mattel, Inc. Game scoring system. 4,162,793, Cl. 273-121.00A.

Cunningham, Alton J.: *See*—
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.

Curry, Charles D. B.: *See*—
Reins, Edward R.; and Curry, Charles D. B., 4,163,286, Cl. 364-719.000.

Cuson, Stanley N.: *See*—
Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K., 4,162,766, Cl. 239-656.000.

Cutler-Hammer, Inc.: *See*—
Piber, Earl T., 4,163,136, Cl. 200-296.000.

D. R. K. Limited: *See*—
Kelsey, David R., 4,162,790, Cl. 273-58.00C.

D. Swarovski & Co.: *See*—
Schwab, Kurt; and Koholka, Richard, 4,162,820, Cl. 350-36.000.

Daetwyler, Kurt; and Jaggi, Rudolf, to International Business Machines Corporation. Method of modifying the performance characteristics of a Josephson junction. 4,163,156, Cl. 250-492.00B.

Daigle, Milton L. Center section for oil well perforation testing device. 4,162,705, Cl. 166-186.000.

Daimler-Benz Aktiengesellschaft: *See*—
Altmann, Werner, 4,162,637, Cl. 74-711.000.

Dakota Electron, Inc.: *See*—
Johnson, Phillip R., 4,162,708, Cl. 172-4.500.

Daleo, Joseph, to Triple Cuff Corporation. Multiple-cuff handcuff. 4,162,622, Cl. 70-16.000.

Dallen, John A.; and Green, Harry W., to Standard Products Company, The. Waste disposal by incineration. 4,162,656, Cl. 110-221.000.

Damman, Bernard A. Anchor bolt assembly. 4,162,596, Cl. 52-295.000.

Damusis, John A.; and Rageb, Sam M., to Dana Corporation. Method of making metal gaskets. 4,162,569, Cl. 29-417.000.

Dana Corporation: *See*—
Damusis, John A.; and Rageb, Sam M., 4,162,569, Cl. 29-417.000.

Dangelmaier, Karl; and Bareis, Alfred, to L. Schuler GmbH. Aligning and stacking arrangement. 4,162,734, Cl. 414-27.000.

Daradimos, Georg: *See*—
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.

Darby, Ronald A. Automatic method to identify aircraft types. 4,163,283, Cl. 364-439.000.

Darrin, John W., to Bush Universal, Inc. Shoe stiffener. 4,162,583, Cl. 36-76.00R.

Davies, William, to J. C. Renfroe and Sons, Inc. Lifting clamp. 4,162,804, Cl. 294-101.000.

Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr. Barbeque pit apparatus. 4,162,650, Cl. 99-419.000.

Daymond Limited: *See*—
Reid, Robert; and Lustvee, Kaljo, 4,162,861, Cl. 403-242.000.

De Laval Separator Company, The: *See*—
Berit, Bradley I., 4,162,980, Cl. 210-360.00R.
Berit, Bradley I., 4,162,981, Cl. 210-375.000.

De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefinie: *See*—
de Goede, Barend L., 4,163,122, Cl. 179-15.0AT.

DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, to Procter & Gamble Company, The. Textile treatment compositions. 4,162,984, Cl. 252-8.800.

Decaux, Jean-Claude, to J. C. Decaux Paris, Publicite Abribus. Display panel with movable posters. 4,162,585, Cl. 40-518.000.

Decima, Elmer E.; and Briggs, Albert T., to Wean United, Inc. Rolling mill. 4,162,626, Cl. 72-238.000.

Deere & Company: *See*—
Guetzlaff, Robert P., 4,162,567, Cl. 29-159.00R.

de Goede, Barend L., to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefinie. Method and apparatus for automatically correcting errors in a cyclic routing memory of a time division multiplexed trunk exchange. 4,163,122, Cl. 179-15.0AT.

DeGroot, Theodore C. Lightweight, quick assembly furniture. 4,162,731, Cl. 211-126.000.

DeKalb AgResearch, Inc.: *See*—
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.

Delpuech, Jean-Jacques: *See*—
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.

DeMaggio, John M. Laser beam arrangement. 4,163,200, Cl. 331-94.50C.

Demange, Michel: *See*—
Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.

Demers, Normand; and Martin, Claude. Measuring and dispensing apparatus. 4,162,750, Cl. 222-250.000.

Demkowicz, Robert M.: *See*—
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., 4,162,728, Cl. 206-345.000.

DeMoss, Dean, to Burroughs Corporation. Flying head with compound-foil. 4,163,267, Cl. 360-102.000.

De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, to Oronzio de Nora Impianti Elettrochimici S.p.A. Monopolar electrolytic diaphragm cells with removable and replaceable dimensionally stable anodes and method of inserting and removing said anodes. 4,162,953, Cl. 204-252.000.

Deroide, Bruno: *See*—
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Deschamps, Andre: *See*—
Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, 4,163,043, Cl. 423-234.000.

Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., to Avon Products, Inc. Method and apparatus for assembling rings. 4,163,142, Cl. 219-79.000.

Desnarquest et C.: *See*—
Bardet, Gerard, 4,163,140, Cl. 219-10.55B.

Dethlefs, David H. Fishing pole. 4,162,587, Cl. 43-18.00R.

Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, to Institut Francais du Petrole. Process for removing H_2S and CO_2 from

gases and regenerating the adsorbing solution. 4,163,043, Cl. 423-234.000.
Dhondt, Roland O., to Union Oil Company of California. Shale retorting process and apparatus. 4,162,960, Cl. 208-11.00R.
Diamalt Aktiengesellschaft: *See*—
Maeke, Siegfried; and Rambacher, Paul, 4,163,017, Cl. 260-397.100.
Diamond International Corporation: *See*—
Anderson, Walter F.; and Meyer, Ronald A., 4,162,746, Cl. 222-153.000.
Reifers, Richard F.; and Bixler, Kenneth D., 4,162,759, Cl. 229-2.50R.
Diamond, Julius, to Cooper Laboratories, Inc. Carbamylguanidine antimicrobial compounds. 4,163,022, Cl. 260-553.00R.
DiLaura, David L.: *See*—
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.
Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., to Bell Telephone Laboratories, Incorporated. High mobility multilayered heterojunction devices employing modulated doping. 4,163,237, Cl. 357-16.000.
Dippold, William L.: *See*—
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
Dixon, Kenneth K.: *See*—
Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
Dodd, Alan M., to Dunlop Limited. Tire deflation warning device. 4,163,207, Cl. 340-58.000.
Doi, Tadashi; and Takahashi, Harumi, to Kao Soap Co., Ltd. Process for preparation of asphalt-epoxy resin composition. 4,162,998, Cl. 260-28.00R.
Domtar Inc.: *See*—
Lapointe, Joseph A., 4,162,769, Cl. 241-68.000.
Donaldson Company, Inc.: *See*—
Sullivan, Bruce M.; and Kaluza, Allen M., 4,162,906, Cl. 55-346.000.
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, to Metallgesellschaft Aktiengesellschaft; and Bayer Aktiengesellschaft. Process for producing sulfuric acid from waste acid and iron sulfate. 4,163,047, Cl. 423-531.000.
Dow Chemical Company, The: *See*—
Beafore, Frank J., 4,163,079, Cl. 428-411.000.
Britton, Thomas C.; and Trepanier, Donald L., 4,163,104, Cl. 544-160.000.
Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.
Wysong, Don V., 4,163,105, Cl. 548-342.000.
Dow Corning Corporation: *See*—
Romenesko, David J., 4,163,082, Cl. 428-447.000.
Schulz, Jay R., 4,163,081, Cl. 428-429.000.
Talcott, Thomas D., 4,162,676, Cl. 128-214.00D.
Dowd, Daniel J., to Westvaco Corporation. Stretchable material rewinding machine. 4,163,180, Cl. 318-6.000.
Dowty, James R., to Ford Aerospace & Communications Corp. Method for adjusting the radius of curvature of a spherical mirror. 4,162,825, Cl. 350-295.000.
Doyle, Terrence W.: *See*—
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,162,938, Cl. 435-75.000.
Dragone, Giorgio. Apparatus for developing films, and particularly X-ray films as employed in dental applications. 4,162,841, Cl. 354-310.000.
Dubrous, Francis: *See*—
Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.
Dunlop Limited: *See*—
Dodd, Alan M., 4,163,207, Cl. 340-58.000.
Dunne, Maurice J.: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
Duo-Fast Corporation: *See*—
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., 4,162,728, Cl. 206-345.000.
Du Pont de Nemours, E. I., and Company: *See*—
Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.
Duraiswamy, Kandaswamy, to Occidental Petroleum Corporation. Production of hydrogenated hydrocarbons. 4,162,959, Cl. 208-8.00R.
Durr, Dieter: *See*—
Kristiansen, Odd; and Durr, Dieter, 4,163,056, Cl. 424-324.000.
Dursch, Walter; Linke, Fritz; and Finke, Manfred, to Hoechst AG. Polyphosphinites and a process for their preparation. 4,163,034, Cl. 260-931.000.
Dynamit Nobel AG: *See*—
Kuhnel, Werner; and Spielau, Paul, 4,163,085, Cl. 521-96.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
E M I Limited: *See*—
Voles, Roger, 4,162,775, Cl. 244-3.170.
Earley, Vernon A. Burglar bar apparatus. 4,162,590, Cl. 49-55.000.
Early, Leon. Apparatus for collating cans and other articles. 4,162,722, Cl. 198-418.000.
Earth Chemical Company, Limited: *See*—
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
Eastman Kodak Company: *See*—
Frank, Lee F.; and Lee, James K., 4,162,832, Cl. 354-51.000.
Platt, Albert P., III, deceased, 4,162,848, Cl. 355-14.000.
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for fast adhesion of silver to nitride type ceramics. 4,163,074, Cl. 427-229.000.
Eberspacher, J.: *See*—
Gaysert, Gerhard, 4,163,041, Cl. 422-179.000.
Ebihara, Norio; and Tatsuzawa, Kaichi, to Sony Corporation. Noise reduction system. 4,163,258, Cl. 358-167.000.
Eck, David L.: *See*—
Oetjen, Georg; and Eck, David L., 4,162,628, Cl. 73-141.00A.
Edefonti, Lucio: *See*—
Buzio, Pierpaolo; and Edefonti, Lucio, 4,163,080, Cl. 428-424.000.
Edmaier, Franz: *See*—
Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
Ehrhard, Fritz: *See*—
Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.
Ehrlich, Josef, to Outboard Marine Corporation. Stratified charge four-stroke engine. 4,162,663, Cl. 123-75.00B.
Eisert, Klaus, to Phonix Elektrizitatsgesellschaft H. Knumann & Co. Electrical terminal. 4,162,819, Cl. 339-247.000.
Elettronica San Giorgio Elsag S.p.A.: *See*—
Stringa, Luigi, 4,163,281, Cl. 364-200.000.
Elgeti, Klaus: *See*—
Zlokarnik, Marko; and Elgeti, Klaus, 4,162,971, Cl. 210-15.000.
Elmetherm: *See*—
Reynier, Jacques A., 4,163,144, Cl. 219-368.000.
Elmo Company Limited: *See*—
Nonogaki, Masahiko, 4,162,822, Cl. 350-187.000.
Eltra Corporation: *See*—
Purdy, James A., 4,163,165, Cl. 310-154.000.
Emerick, Richard D.: *See*—
Mason, Ron G.; and Rice, Herbert L., 4,163,066, Cl. 426-99.000.
Emrich, Hinderk M. Diagnostic means for the rapid detection of mucoviscidosis. 4,163,039, Cl. 422-56.000.
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pesticidally active 4,5-dichloro-3-substituted-phenylimino-1,2-dithiolenes. 4,163,059, Cl. 424-277.000.
Endo, Akira; and Kitahara, Tohru, to Fuji Photo Film Co., Ltd. Treatment of photographic processing solutions. 4,163,023, Cl. 260-556.00A.
Enegess, David N., to Combustion Engineering Inc. Vortex gas separator. 4,162,901, Cl. 55-17.000.
Engel, George W. Mailbox signalling device. 4,163,225, Cl. 340-569.000.
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., to Unimation, Inc. Programmable automatic assembly system. 4,163,183, Cl. 318-568.000.
Epstein, Arthur C.: *See*—
Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.
Erickson, Wallace A.; and Suh, Byoung I., to Wallace A. Erickson & Company. Dental filling materials. 4,163,004, Cl. 260-42.140.
Ernst Leitz Wetzlar GmbH: *See*—
Fritsche, Rainer; and Ringelhan, Helmut, 4,163,148, Cl. 250-201.000.
Stankewitz, Hans-Werner, 4,163,150, Cl. 250-205.000.
Erway, Duane D.: *See*—
Rowlette, John J., 4,162,990, Cl. 252-383.000.
Esaki, Leo; and Tsu, Raphael, to United States of America, Army. Infrared semiconductor device with superlattice region. 4,163,238, Cl. 357-17.000.
Euteco S.p.A.: *See*—
Merli, Claudio; and Francia, Carlo, 4,162,698, Cl. 152-354.0RB.
Evans, Albert B., Jr.: *See*—
Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.
Evans, Bryce B.: *See*—
Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., 4,162,801, Cl. 285-45.000.
Excellon Industries: *See*—
Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
Fabbrica Italiana Magneti Marelli S.p.A.: *See*—
Maioglio, Mauro, 4,162,666, Cl. 123-117.00D.
Fabreeka Products Company: *See*—
Summers, Frank B., 4,162,727, Cl. 198-688.000.
Fahrbach, Gerhard: *See*—
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
Fairchild Camera and Instrument Corporation: *See*—
Frazee, Jerome A., 4,163,160, Cl. 307-260.000.
Farber, Karl-Heinz, to Bosch Siemens Hausgerate GmbH. Variable-speed electromotive drive, especially for household appliances such as dough kneaders. 4,163,181, Cl. 318-245.000.

Farina, Attilio; and Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for providing saw-tooth current in a coil. 4,163,179, Cl. 315-408.000.

Fasciati, Alfred: *See—*
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.

Faulstich, George W., to Three Sisters Ranch Enterprises. Plastic cap and container construction. 4,162,736, Cl. 215-256.000.

Federico, Joseph J.; and Gass, William L. Hairdressing device. 4,163,143, Cl. 219-225.000.

Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki. Surgical apparatus for simultaneous resection of soft tissues and their suturing with metal staples. 4,162,678, Cl. 128-305.000.

Feeny, Richard W., to American Cyanamid Co. 1,2-Dimethyl-3,5-diphenylpyrazolium-2,2-dichloropropionate. 4,162,913, Cl. 71-92.000.

Feldkamper, Richard: *See—*
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, 4,162,602, Cl. 53-415.000.

Fellnor, John R.; and Love, William J., Jr., to Melting Systems, Incorporated. Scrap preheater modular roof assembly. 4,162,891, Cl. 432-247.000.

Ferloni, Vincenzo: *See—*
Rossi, Guglielmo; and Ferloni, Vincenzo, 4,163,129, Cl. 200-81.400.

Fiat-Allis Macchine Movimento Terra S.p.A.: *See—*
Grattapaglia, Giorgio; and Cecchi, Carlo, 4,162,615, Cl. 60-478.000.

Fibrostampa S.R.L.: *See—*
Frezzotti, Armando, 4,162,936, Cl. 162-276.000.

Filippov, Iosif F.: *See—*
Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.

Filstrup, Poul, to Alfa-Laval AB. Method of separating animal raw material. 4,163,009, Cl. 260-112.00R.

Filterwerk Mann & Hummel GmbH: *See—*
Schuler, Gustav, 4,162,905, Cl. 55-337.000.

Finch, Robert E., to Nalco Chemical Company. Flotation of deep mined coal with water-in-oil emulsions of sodium polyacrylate. 4,162,966, Cl. 209-166.000.

Finke, Manfred: *See—*
Dursch, Walter; Linke, Fritz; and Finke, Manfred, 4,163,034, Cl. 260-931.000.

Finney, Philip F., to Thermo-Couple Products Company, Inc. Engine manifold temperature sensing device. 4,162,929, Cl. 136-233.000.

Firetrol, Inc.: *See—*
Henningsen, Lee A.; Hare, John E.; and Amann, David J., 4,163,220, Cl. 340-331.000.

Firsov, Vitaly M.: *See—*
Litvinov, Pavel I.; Firsov, Vitaly M.; and Knyazher, Galina B., 4,162,921, Cl. 106-39.800.

Fitzsimmons, George W., to Boeing Company, The. Dual mode microwave mixer. 4,163,232, Cl. 343-6.80R.

Fleig, Helmut: *See—*
Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.

Fleischhacker, James E., to AMP Incorporated. Means for cable section and equipment transfer without service interruption. 4,162,815, Cl. 339-19.000.

Fleming, Charlie. Combination watchband and writing instrument. 4,162,754, Cl. 224-165.000.

Fleming, Maurice C. Internal combustion engine and fuel introducing means therefor. 4,162,664, Cl. 123-75.00B.

Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., to Texaco Inc. Oil-in-water emulsion. 4,162,989, Cl. 252-312.000.

Floyd, James K.: *See—*
Clay, Paul E.; and Floyd, James K., 4,162,904, Cl. 55-276.000.

FMC Corporation: *See—*
Kraft, Robert E., 4,162,778, Cl. 248-610.000.

Foley, Newman C. Hitching apparatus. 4,162,798, Cl. 280-475.000.

Fontainas, Luc M.: *See—*
Maes, Robert H.; and Fontainas, Luc M., 4,162,915, Cl. 75-14.000.

Ford Aerospace & Communications Corp.: *See—*
Dowty, James R., 4,162,825, Cl. 350-295.000.

Ford Motor Company: *See—*
Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., 4,162,631, Cl. 73-362.0AR.

Forschirm, Alex S.: *See—*
Hannon, Martin J.; and Forschirm, Alex S., 4,163,031, Cl. 525-5.000.

Fracaroli, Brenda B.: *See—*
Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.

Francia, Carlo: *See—*
Merli, Claudio; and Francia, Carlo, 4,162,698, Cl. 152-354.0RB.

Franckowiak, Sigismond: *See—*
Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, 4,163,043, Cl. 423-234.000.

Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, to Ciba-Geigy Corporation. 3-Phenyl-2-thioxo-2H,5H-pyrano[3,2-c][1]benzopyran-5-one derivatives, a process of making and a method of using them as rodenticides. 4,163,061, Cl. 424-279.000.

Frank, Jerome M. Eye protectors. 4,162,542, Cl. 2-15.000.

Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Exposure control with piezoelectric latch control. 4,162,832, Cl. 354-51.000.

Frazee, Jerome A., to Fairchild Camera and Instrument Corporation. Input stage for automotive ignition control circuit. 4,163,160, Cl. 307-260.000.

Freeman, Joseph T.; and Colish, Aaron, to Bath-Ladd Corporation. Safety railing. 4,162,544, Cl. 4-185.00H.

Frezzotti, Armando, to Fibrostampa S.R.L. Washing device for impermeable areas of cylinder molds. 4,162,936, Cl. 162-276.000.

Fritsche, Rainer; and Ringelhan, Helmut, to Ernst Leitz Wetzlar GmbH. Automatic focusing device probe comprising a focusing device and method of focusing a probe. 4,163,148, Cl. 250-201.000.

Fritz Eichenauer, Firma: *See—*
Meywald, Klaus, 4,163,146, Cl. 219-542.000.

Froats, Blaine. Apparatus for separating paper fibres from portions of polyethylene film material. 4,162,768, Cl. 241-45.000.

Frommer, Elmar: *See—*
Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.

Frutiger, Peter. Data processing machine, especially ciphering equipment. 4,162,762, Cl. 235-461.000.

Fuji Photo Film Co., Ltd.: *See—*
Endo, Akira; and Kitahara, Tohru, 4,163,023, Cl. 260-556.00A.

Fuji Photo Optical Co., Ltd.: *See—*
Asano, Seiji, 4,162,835, Cl. 354-106.000.
Hosono, Tsutomu, 4,163,178, Cl. 315-241.00P.

Fujimoto Company, Limited: *See—*
Yazaki, Seiichi, 4,162,672, Cl. 128-1.300.

Fujitsu Limited: *See—*
Miura, Kenichi, 4,163,211, Cl. 340-146.200.

Fukaya, Hiroyasu: *See—*
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.

Fukuma, Hideo: *See—*
Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.

Fukumori, Yoshiki: *See—*
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.

Fukushima, Hiroshi: *See—*
Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.

Funabashi, Tetsuji: *See—*
Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.

Furusho, Takao: *See—*
Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.

Fushima, Haruo: *See—*
Orii, Katsuo; and Fushima, Haruo, 4,162,717, Cl. 182-48.000.

G.K.N. Fasteners Limited: *See—*
Gill, Peter J., 4,162,639, Cl. 81-52.40R.

Gaillac, Jean-Paul R.: *See—*
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Garbero, James; and Cook, Ronald F. Lighted display chamber. 4,162,814, Cl. 312-223.000.

Garbutt, John T., to Grain Processing Corporation. Isolation of proteinaceous materials. 4,163,010, Cl. 260-112.00R.

Gardner, Horace L.: *See—*
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.

Gass, William L.: *See—*
Federico, Joseph J.; and Gass, William L., 4,163,143, Cl. 219-225.000.

Gastebois, Philippe M. D.: *See—*
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Gateway Industries, Inc.: *See—*
Miskowicz, John S., 4,163,128, Cl. 200-61.58B.

Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, to Rhone-Poulenc-Textile. Device for soil irrigation. 4,162,863, Cl. 405-45.000.

Gaudig, Jay R.: *See—*
Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.

Gaysert, Gerhard, to Eberspacher, J. Support for elastically mounting a ceramic honeycomb catalyst. 4,163,041, Cl. 422-179.000.

Gebauer, Herbert: *See—*
Kubens, Rolf; Ehrhard, Fritz; and Gebauer, Herbert, 4,163,095, Cl. 528-67.000.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Oberste-Beulmann, Klaus, 4,162,810, Cl. 299-43.000.

Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik: *See—*
Hofmann, Dionys, 4,162,634, Cl. 73-462.000.

Gebr. Hofmann G.m.b.H. & Co. KG, Mashinenfabrik: *See—*
Muller, Richard, 4,162,633, Cl. 73-462.000.

Gee, Alan E., to American Optical Corporation. Video photographic system. 4,162,830, Cl. 354-23.00R.

Gellhaus, Derald B., to Kolberg Manufacturing Corporation. Screen apparatus for sorting fragmented material. 4,162,968, Cl. 209-400.000.

General Electric Company: *See—*
Banucci, Eugene G.; and Boldebuck, Edith M., 4,163,030, Cl. 525-429.000.
Hedges, Charles V.; and Mark, Victor, 4,163,116, Cl. 568-723.000.
Horvay, Julius B., 4,162,571, Cl. 29-460.000.

Huseby, Irvin C., 4,162,918, Cl. 75-171.000.
Niznik, George E., 4,163,037, Cl. 264-54.000.
Ragonese, Louis J.; and Yang, Neng-Tze, 4,163,244, Cl. 357-44.000.
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.
Stone, Aidan M., 4,162,621, Cl. 68-23.200.
Webb, William M., 4,162,566, Cl. 29-157.00R.

Gerg, Robert L.: *See—*
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.

Gerken, Rudolf: *See—*
Dorr, Karl-Heinz; Daradimos. Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.

Gilbert, Walter W.: *See—*
Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.

Gilbert, William W., III; and Gomez, Eduardo W., to United States of America, Air Force. Canted spar with intermediate intercostal stiffeners. 4,162,777, Cl. 244-123.000.

Gill, Peter J., to G.K.N. Fasteners Limited. Load indicating nut wrench. 4,162,639, Cl. 81-52.40R.

Gillich, Thomas N., to American Hoechst Corporation. Lithographic plate finisher. 4,162,920, Cl. 106-14.500.

Gipson, Carl R.: *See—*
Willingham, Millard L., 4,162,550, Cl. 5-123.000.

Giraud, Georges M., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Arrangement for checking a contact inserted between a transmitter circuit and a receiver circuit to allow electrical signals to be transmitted. 4,163,210, Cl. 340-146.10E.

Giraudi, Edouard: *See—*
Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, 4,163,109, Cl. 560-122.000.

Gironda, Ralph F., Jr. Archaeological sifting basket. 4,162,967, Cl. 209-235.000.

Glaser, Richard: *See—*
van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.

Goetsch, Roland H.: *See—*
Kollmann, Harry; and Goetsch, Roland H., 4,162,935, Cl. 162-220.000.

Goffinet, Pierre C. E.: *See—*
DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.

Gold, Elijah H.: *See—*
Neustadt, Bernard R.; and Gold, Elijah H., 4,163,053, Cl. 424-230.000.

Gold, Nathan, to Polaroid Corporation. Camera and method for selectively compressing scene brightness. 4,162,831, Cl. 354-31.000.

Goldammer, Georg: *See—*
van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.

Gomez, Eduardo W.: *See—*
Gilbert, William W., III; and Gomez, Eduardo W., 4,162,777, Cl. 244-123.000.

Gonot, Fred P., Jr.; and Kalliantas, Louis. Combination bookmark and writing instrument holder. 4,162,800, Cl. 281-42.000.

Goraj, Boguskaw: *See—*
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokicki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.

Gorcik, Stanley W.: *See—*
Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.

Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc. Method of treating hypercholesterolemia with candimycin. 4,163,050, Cl. 424-115.000.

Gorin, Everett, to Continental Oil Company; and United States of America, Energy. Method for producing hydrocarbon fuels and fuel gas from heavy polynuclear hydrocarbons by the use of molten metal halide catalysts. 4,162,963, Cl. 208-108.000.

Gorsky, Egon, to Gorsky, Egon. Aquarium water aeration device. 4,163,035, Cl. 261-77.000.

Gossard, Arthur C.: *See—*
Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.

Gove, Donald C., to Amkey, Incorporated. Synchronous phase detected keyboard. 4,163,222, Cl. 340-365.00S.

Graf, Richard, to Bosch Siemens Hausgerate GmbH. Refill container for pumpable active ingredients of washing agents. 4,162,747, Cl. 222-185.000.

Grain Processing Corporation: *See—*
Garbutt, John T., 4,163,010, Cl. 260-112.00R.

Grand, Gerd: *See—*
Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.

Granda, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.

Grather, Gunter; and Rabus, Friedrich, to Robert Bosch GmbH. Multispark ignition system for internal combustion engines. 4,162,665, Cl. 123-117.00R.

Grattapaglia, Giorgio; and Cecchi, Carlo, to Fiat-Allis Macchine Movimento Terra S.p.A. Hydraulic fluid tank pressurization device. 4,162,615, Cl. 60-478.000.

Gray, David, to Greenmace Limited. Oil burner. 4,162,887, Cl. 431-28.000.

Green, Gerald G. Enclosed flotation device. 4,162,972, Cl. 210-44.000.

Green, Harry W.: *See—*
Dallen, John A.; and Green, Harry W., 4,162,656, Cl. 110-221.000.

Green, Norman W., to Occidental Petroleum Corporation. Slot pyrolysis reactor and method of pyrolysis. 4,162,943, Cl. 201-12.000.

Greenmace Limited: *See—*
Gray, David, 4,162,887, Cl. 431-28.000.

Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., to Hydrotrole Limited. Hydro-pneumatic flexible bladder accumulator. 4,162,692, Cl. 138-30.000.

Gregory, Harold D., to Gregory, Virginia M. Cryogenic device and method for necrotizing and shaving live tissue. 4,162,677, Cl. 128-303.100.

Gregory, Virginia M.: *See—*
Gregory, Harold D., 4,162,677, Cl. 128-303.100.

Greven, Johann, to SCHUMAG GmbH. Eccentric cutters for longitudinally severing elongated material to be drawn. 4,162,642, Cl. 83-328.000.

Grimm, Hugo: *See—*
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.

Groombridge, Frederick W. H.; and Butler, Ronald N., to Celanese Corporation. Water closets. 4,162,548, Cl. 4-300.000.

Grooss, Frank A.; and Simmons, Gerald P., to Caterpillar Tractor Co. Lift arm assembly. 4,162,872, Cl. 414-713.000.

Grumman Aerospace Corporation: *See—*
Schultz, Jack L., 4,163,235, Cl. 343-100.0SA.

GTE Sylvania Incorporated: *See—*
Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.

Guetzlaff, Robert P., to Deere & Company. Method for making a sheet metal pulley. 4,162,567, Cl. 29-159.00R.

Guignard, Claude F.; and Perrette, Bernard J., to Traitement de l'Information et Techniques Nouvelles; Banque de France; and Perrette, Bernard Julien. Data medium scanning process and apparatus. 4,163,157, Cl. 250-561.000.

Guillemaud, Henri: *See—*
Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, 4,162,863, Cl. 405-45.000.

Guillemin, Claude; and Mayen, Christian, to Prolabo. Means for removably securing separation column within column chromatography apparatus. 4,162,977, Cl. 210-198.00C.

Gulf Oil Corporation: *See—*
Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.

Gulf Research & Development Company: *See—*
Marmo, Joseph F., 4,162,961, Cl. 208-57.000.

Gunther, Albert W. Pressure control device. 4,162,704, Cl. 166-77.500.

Gunther, Donald A., to American Sterilizer Company. Monitoring ethylene oxide sterilization residual with enzymes. 4,162,942, Cl. 435-17.000.

Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I. Non-salient pole synchronous electric generator. 4,163,163, Cl. 310-59.000.

Haak, Edward L.: *See—*
Harker, James S.; Harris, Earl J.; and Haak, Edward L., 4,162,862, Cl. 404-72.000.

Habermeier, Jurgen: *See—*
Buxbaum, Lothar; Habermeier, Jurgen; and Batzer, Hans, 4,163,099, Cl. 528-172.000.

Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, to BASF Aktiengesellschaft. 2-Trichloromethyl-4-nitrobenzenesulfenic acid derivatives. 4,163,020, Cl. 260-454.000.

Hahn, William F., to Pennsylvania Crusher Corporation. Impacting crusher with variable flow feed distributor. 4,162,767, Cl. 241-30.000.

Haley, William E. Battery state-of-charge indicator. 4,163,186, Cl. 320-48.000.

Hall, Ernest M., Jr., to Western Geophysical Co. of America. Apparatus and method for seismic wave detection. 4,163,206, Cl. 340-17.00R.

Hallen, Jan-Ake. Sink for wash-basins, drainbowls and the like. 4,162,545, Cl. 4-190.000.

Hammann, Ingeborg: *See—*
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.

Hanano, Toshio: *See—*
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Haneishi, Kohei: *See—*
Morii, Kokichi; and Haneishi, Kohei, 4,163,203, Cl. 334-86.000.

Hannon, Martin J.; and Forschirm, Alex S., to Celanese Corporation. Powder composition and method of preparation. 4,163,031, Cl. 525-5.000.

Hannoschock, Kurt: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

Hanson, Brian A.: *See*—
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.

Haragushi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Motor drive device for camera. 4,162,837, Cl. 354-173.000.

Haraikawa, Tetsuo, to Tokico Ltd. Mechanical disc brake. 4,162,720, Cl. 188-71.900.

Harakawa, Mototaka: *See*—
Sato, Yukio; Harakawa, Mototaka; and Mitumori, Yoshio, 4,163,223, Cl. 340-384.00R.

Harden, Phillip L., to Bowmar Instrument Corporation. Flush lighted flat keyboard assembly. 4,163,138, Cl. 200-310.000.

Hare, John E.: *See*—
Henningsen, Lee A.; Hare, John E.; and Amann, David J., 4,163,220, Cl. 340-331.000.

Harker, James S.; Harris, Earl J.; and Haak, Edward L. Pavement stripping apparatus and method. 4,162,862, Cl. 404-72.000.

Harrell, John T.: *See*—
Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.

Harris Corporation: *See*—
McRae, Daniel D., 4,163,209, Cl. 340-146.10E.

Harris, Earl J.: *See*—
Harker, James S.; Harris, Earl J.; and Haak, Edward L., 4,162,862, Cl. 404-72.000.

Harrison, George C., to Polaroid Corporation. Electronic flash inhibit arrangement. 4,162,836, Cl. 354-139.000.

Harry W. Dietert Co.: *See*—
Steinmueller, Ralph E., 4,162,632, Cl. 73-432.00A.

Harshaw Chemical Company, The: *See*—
Swinehart, Philip R.; and Swartz, John M., 4,163,240, Cl. 357-29.000.

Hartog, Jan; and Zwagemakers, Johannes M. A., to U.S. Philips Corporation. Aralkylamino carboxylic acids and derivatives having spasmolytic activity. 4,163,060, Cl. 424-278.000.

Hartung, Harold A., to MacAndrews and Forbes Company. Glycyrrhizin-free fractions from licorice root and process for obtaining such fractions. 4,163,067, Cl. 426-573.000.

Hasker, Jan, to U.S. Philips Corporation. Low-pressure gas discharge lamp. 4,163,169, Cl. 313-203.000.

Hasselmeier, Helmut: *See*—
Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.

Haubner, Georg: *See*—
Wesemeyer, Jurgen; and Haubner, Georg, 4,163,217, Cl. 340-167.00R.

Hayashi, Midori: *See*—
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.

Hayashida, Yoshihiro, to Tokico Ltd. Hydraulic master cylinder. 4,162,616, Cl. 60-533.000.

Hays, Victor. Food warmer assembly for use with a vehicle engine. 4,162,670, Cl. 126-19.500.

Hedges, Charles V.; and Mark, Victor, to General Electric Company. Process for producing bisphenols. 4,163,116, Cl. 568-723.000.

Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., to Studiengesellschaft Kohle mbH. Process for controlling the catalytic co-oligomerization of 1,3-dienes with Schiff's bases. 4,163,024, Cl. 260-566.00R.

Heinrich Josef Winter Kunststoffverarbeitung unde Werkzeugbau GmbH: *See*—
Winter, Heinrich J., 4,162,552, Cl. 15-104.920.

Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., to Du Pont de Nemours, E. I., and Company. Preparation of esters of poly-(tetramethylene ether) glycol. 4,163,115, Cl. 560-240.000.

Heinz, Carlo: *See*—
Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, 4,162,784, Cl. 266-176.000.

Heitman, Marshall D.; and Butler, Joe D., to Otis Engineering Corporation. Planetary transmission with hydraulic engagement and disengagement. 4,162,713, Cl. 180-242.000.

Heitmann, Jurgen, to Robert Bosch GmbH. Field sequential transmission of luminance and chrominance information. 4,163,248, Cl. 358-12.000.

Helwig, William F., Jr.; and Jeffries, Henry D., Jr., to Avtec Industries, Inc. Ground fault and fire detector system. 4,163,269, Cl. 361-42.000.

Henderson, Joseph M., Jr. Target acquisition system. 4,162,646, Cl. 89-41.0EA.

Henig, Hans: *See*—
Tscherwitschke, Richard; and Henig, Hans, 4,162,951, Cl. 204-213.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.

Henningsen, Lee A.; Hare, John E.; and Amann, David J., to Firetrol, Inc. Distress signalling device. 4,163,220, Cl. 340-331.000.

Heraeus Quarzschmelze GmbH: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.

Herchenbach, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the lowering of the alkali content of cement calcined to completion. 4,162,922, Cl. 106-100.000.

Hercules Incorporated: *See*—
Paul, James T., Jr.; and Weldy, Winfred E., 4,163,003, Cl. 260-40.00R.
Walsh, Robert M., 4,162,997, Cl. 260-27.00R.

Herou, John w., to J. H. Electric Co., Inc. Position sensitive safety switch. 4,163,127, Cl. 200-61.470.

Herr, John A.: *See*—
Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.

Herrmann, Guenter: *See*—
Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, 4,163,027, Cl. 260-586.00P.

Hess, Bernhard; and Kraft, Klaus, to Bayer Aktiengesellschaft. Process for the production of polyesters for air-drying unsaturated polyester resins. 4,163,093, Cl. 528-301.000.

Hess, Georgia E. Wig drying attachment for hair dryers. 4,162,580, Cl. 34-103.000.

Hetland, Lillian; and Schneeweiss, Peter R. Rotary measuring chamber with size adjustment. 4,162,751, Cl. 222-293.000.

Hewlett-Packard Company: *See*—
Kamins, Theodore I.; and Sodini, Charles G., 4,163,243, Cl. 357-41.000.

Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, to Takeda Chemical Industries, Ltd. Method for producing Antibiotic C-15003 by culturing nocardia. 4,162,940, Cl. 435-119.000.

Higgins, Bobby L., to Camsco, Inc. Water jet valve assembly. 4,162,763, Cl. 239-101.000.

Hill, John H., to Pennwalt Corporation. Disc centrifuge with underflow discharge. 4,162,760, Cl. 233-19.00R.

Hill, Marjorie M. Method of producing dried, de-shelled brine shrimp cysts. 4,163,064, Cl. 426-2.000.

Hine, Kenneth E., to Canadian Industries Limited. Reduction of steel cathode overpotential. 4,162,949, Cl. 204-140.000.

Hintz, Harold J., to Monsanto Company. Production of tetrabutylhexamethylenediamine by reductive alkylation of hexamethylenediamine with butyraldehyde. 4,163,026, Cl. 260-583.00P.

Hirose, Yasuo, to Bloom Engineering Company, Inc. Combustion apparatus. 4,162,890, Cl. 431-351.000.

Hirschberger, August, to Webasto-Werke W. Baier GmbH & Co. Drive arrangement for a movable vehicle panel. 4,162,805, Cl. 296-137.00G.

Hirt, Thomas D.: *See*—
Van Steenhoven, Frank; and Hirt, Thomas D., 4,162,779, Cl. 248-343.000.

Hisao, Nobuyoshi; and Agui, Takeshi, to Mita Industrial Company. System for reducing band width of image signal. 4,163,260, Cl. 358-261.000.

Hitachi, Ltd.: *See*—
Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.
Ishikawa, Isao; and Sakitani, Yoshio, 4,163,168, Cl. 310-328.000.
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.
Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, 4,163,219, Cl. 340-310.00R.
Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.
Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.
Morooka, Yasuo; and Tanifuji, Shinya, 4,162,624, Cl. 72-8.000.
Sampei, Tohru, 4,163,197, Cl. 330-263.000.
Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, 4,163,149, Cl. 250-204.000.
Shida, Shigeru; and Kajiwara, Toshiyuki, 4,162,627, Cl. 72-247.000.
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.
Tamura, Hifumi; and Ishitani, Tohru, 4,163,153, Cl. 250-423.00R.

Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, to Kabushiki Kaisha Komatsu Seisakusho. Unmanned conveying control system. 4,162,869, Cl. 414-70.000.

Hobbs, Oliver K. Pneumatic conveyor. 4,162,811, Cl. 406-94.000.

Hochiki Corporation: *See*—
Yasuda, Katsuya; and Adachi, Akio, 4,163,224, Cl. 340-520.000.

Hoechst AG.: *See*—
Dursch, Walter; Linke, Fritz; and Finke, Manfred, 4,163,034, Cl. 260-931.000.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pesticidal O-[3-t-butylpyrazol-5-yl]phosphoric and thionophosphoric acid esters. 4,163,052, Cl. 424-200.000.

Hoffmann-La Roche Inc.: *See*—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.
Cohen, Noal; and Saucy, Gabriel, 4,163,021, Cl. 260-456.00P.
Holland, George W.; and Rosen, Perry, 4,163,016, Cl. 260-345.80P.
Zdrodowski, Joseph J., 4,162,689, Cl. 137-266.000.

Hofmann, Dionys, to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik. Method of and apparatus for balancing rotors. 4,162,634, Cl. 73-462.000.

Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, to Cojafex B.V. Installation and process for multistage-controlled flash evaporation. 4,162,945, Cl. 202-173.000.

Hohmann, Gerhard: *See*—
Pettelkau, Hans-Jurgen; and Hohmann, Gerhard, 4,163,091, Cl. 526-208.000.

Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. 16-Substituted prostaglandins. 4,163,016, Cl. 260-345.80P.

Holland, Maeford J.; and Raines, Robert B. Device for removing a runner from a multiple plate die. 4,162,886, Cl. 425-556.000.

Hollaway, William D. Baseball base and installation apparatus. 4,162,789, Cl. 273-25.000.

Holleyman, John E., to J.J.J. Air Injection Systems. Pressure fluid operated power plant. 4,162,614, Cl. 60-370.000.

Holubec, Zenowie M., to Lubrizol Corporation, The. Multigrade lubricants containing interpolymers. 4,162,985, Cl. 252-32.70E.

Homeyer, Bernhard: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.

Honeywell Inc.: *See*—
Bassett, William W.; and Johnson, Eugene D., 4,162,856, Cl. 366-213.000.

Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, to Sony Corporation. Demodulating apparatus with phase shift compensation. 4,163,196, Cl. 329-50.000.

Hood, John D.: *See*—
Box, Stephen J.; and Hood, John D., 4,163,051, Cl. 424-124.000.

Hooker Chemicals & Plastics Corp.: *See*—
Takahashi, Akio, 4,163,033, Cl. 525-53.000.

Hoppner, Dietrich: *See*—
Bachle, Erich; Schehrer, Rudolf; and Hoppner, Dietrich, 4,163,159, Cl. 307-255.000.

Horvay, Julius B., to General Electric Company. Method of constructing refrigerator cabinet. 4,162,571, Cl. 29-460.000.

Hosli, Peter, to Institut Pasteur. Micro-analysis process and device. 4,162,896, Cl. 23-230.00R.

Hosoi, Yuzo: *See*—
Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, 4,162,930, Cl. 148-38.000.

Hosokawa, Yoshihiro: *See*—
Tomii, Kaoru; and Hosokawa, Yoshihiro, 4,163,250, Cl. 358-45.000.

Hosono, Tsutomu, to Fuji Photo Optical Co., Ltd. Flash light discharge device. 4,163,178, Cl. 315-241.00P.

Howard, Clayton L., to Baker International Corporation. Tensive force load cell assembly. 4,162,629, Cl. 73-141.00R.

Huber, Bernhard W., to Bodenseewerk Perkin-Elmer & Co., GmbH. Selected element concentration for flameless atomic absorption spectroscopic measurements. 4,162,849, Cl. 356-36.000.

Hudson, William W.; and Wilson, Woodrow W., to Wilson-Miner R & D. Sod harvesting machine having means for conveying and stacking sod pads. 4,162,726, Cl. 198-678.000.

Hughes Aircraft Company: *See*—
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.

Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Diphenylamine-azo-hydrocarbylsulfonylphenyl dyestuffs. 4,163,013, Cl. 260-206.000.

Humme, Gert: *See*—
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.

Hungerbuhler, Walter: *See*—
Buhler, Arthur; Fasciati, Alfred; and Hungerbuhler, Walter, 4,162,893, Cl. 8-10.100.

Huseby, Irvin C., to General Electric Company. Rare earth metal doped directionally solidified eutectic alloy and superalloy materials. 4,162,918, Cl. 75-171.000.

Husson, Alan L.; and Kurland, Marvin, to Westinghouse Electric Corp. Elevator system. 4,162,719, Cl. 187-29.00R.

Hutson Corporation, The: *See*—
Judd, Oliver S., 4,162,900, Cl. 51-295.000.

Hutson, Jearld L. Multiple emitter and normal gate semiconductor switch. 4,163,241, Cl. 357-38.000.

Hydrotrole Limited: *See*—
Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., 4,162,692, Cl. 138-30.000.

Ichikawa, Tadao: *See*—
Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.

Ideal Industries, Inc.: *See*—
McCord, Daniel, 4,162,638, Cl. 81-9.50R.

Idra AG: *See*—
Kollmann, Harry; and Goetsch, Roland H., 4,162,935, Cl. 162-220.000.

Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system for rotary piston engines. 4,162,669, Cl. 123-210.000.

Iida, Makoto, to Security Patrols Co., Ltd. Safety lock system for controlling access to an area in response to predetermined data inputs. 4,163,215, Cl. 340-149.00A.

Illis, Alexander: *See*—
Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.

Ilmer, Andreas: *See*—
Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.

Imperial Chemical Industries Limited: *See*—
Jones, Peter J. V., 4,162,991, Cl. 252-413.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Farina, Attilio; and Zappala, Giuseppe, 4,163,179, Cl. 315-408.000.

Industriewerk Schaeffler OHG: *See*—
Spiess, Karl, 4,162,568, Cl. 29-281.300.

Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., to North American Manufacturing Company; Burnham Corporation; and Combustion Service and Equipment Corporation. Industrial boiler utilizing multiple fuels and having reduced particulate emission and method of combustion. 4,162,686, Cl. 122-149.000.

Inoue Gomu Kogyo Kabushiki Kaisha: *See*—
Katoh, Hisanori, 4,163,076, Cl. 428-339.000.

Inoue, Nobuyoshi: *See*—
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.

Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, to Ricoh Company, Ltd. Color electrostatic copying machine. 4,162,843, Cl. 355-4.000.

Institut Francais du Petrole: *See*—
Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, 4,163,043, Cl. 423-234.000.

Institut Pasteur: *See*—
Hosli, Peter, 4,162,896, Cl. 23-230.00R.

Institut Transplantatsii Organov I Tkanei: *See*—
Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.

International Business Machines Corporation: *See*—
Bahr, Dietrich J.; Burckardt, Karl H.; and Hasselmeier, Helmut, 4,163,285, Cl. 364-710.000.
Brandon, Fred Y., 4,162,847, Cl. 355-14.000.
Bullock, Michael K., 4,162,786, Cl. 271-64.000.
Daetwyler, Kurt; and Jaggi, Rudolf, 4,163,156, Cl. 250-492.00B.

International Flavors & Fragrances Inc.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.

International Harvester Company: *See*—
Cremer, George D., 4,162,914, Cl. 75-0.50B.

International Nickel Company, Inc., The: *See*—
Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.

International Telephone & Telegraph Corp.: *See*—
Johnson, Charles B., 4,163,174, Cl. 315-10.000.

INTERX Research Corporation: *See*—
Stella, Valentino J.; and Sloan, Kenneth B., 4,163,058, Cl. 424-273.00R.

Inuzuka, Hideo: *See*—
Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.

Irik, Gijsbert W.: *See*—
Marien, Pieter; Boersma, Rintje; and Irik, Gijsbert W., 4,163,118, Cl. 174-99.00B.

Irvin Industries, Inc.: *See*—
Wallin, Jan-Olof, 4,162,773, Cl. 242-107.40A.

Ishihara, Taketoshi; and Watanabe, Yosiaki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Method and device for measuring diopters of astigmatic lenses. 4,162,852, Cl. 356-125.000.

Ishii, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Noise improvement by capacitor bank in magnetic recording and playback apparatus. 4,163,264, Cl. 360-68.000.

Ishii, Kenichiro: *See*—
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.

Ishikawa, Isao; and Sakitani, Yoshio, to Hitachi, Ltd. Two-directional piezoelectric driven fine adjusting device. 4,163,168, Cl. 310-328.000.

Ishitani, Tohru: *See*—
Tamura, Hifumi; and Ishitani, Tohru, 4,163,153, Cl. 250-423.00R.

Ito, Fumio: *See*—
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.

Ito, Isami, to Chinon Industries Incorporated. Overlap recording device for sound cinecamera. 4,163,261, Cl. 360-13.000.

Ito, Tadashi: *See*—
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.

Ito, Yoichiro, to United States of America, Health, Education and Welfare. Flow-through coil planet centrifuges with adjustable rotation/revolution of column. 4,162,761, Cl. 233-24.000.

Ito, Yuji, to Canon Kabushiki Kaisha. Wide angle objective for ophthalmoscopic instrument. 4,162,827, Cl. 351-7.000.

Iwase, Kazuo: *See*—
Kawai, Hisasi; and Iwase, Kazuo, 4,162,667, Cl. 123-117.00D.

J. C. Decaux Paris, Publicite Abribus: *See*—
Decaux, Jean-Claude, 4,162,585, Cl. 40-518.000.

J. C. Renfroe and Sons, Inc.: *See*—
Davies, William, 4,162,804, Cl. 294-101.000.

J. H. Electric Co., Inc.: *See*—
Herou, John w., 4,163,127, Cl. 200-61.470.

J. I. Case Company: *See*—
Nelson, Carl D., 4,162,712, Cl. 180-253.000.

J.J.J. Air Injection Systems: *See*—
Holleyman, John E., 4,162,614, Cl. 60-370.000.

Jackson, Theodore A., to Cadillac Gage Company. Wiper drive assembly. 4,162,555, Cl. 15-250.010.

Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Diesel internal combustion engine. 4,162,668, Cl. 123-179.00F.

Jaggi, Rudolf: *See*—
Daetwyler, Kurt; and Jaggi, Rudolf, 4,163,156, Cl. 250-492.00B.

James, Wakelf. Archery sight. 4,162,579, Cl. 33-265.000.

Jamesbury Corp.: *See*—
Anderson, Carl S., 4,162,690, Cl. 137-385.000.
Japan Steel Works, Ltd., The: *See*—
Mikarai, Makoto, 4,162,758, Cl. 228-131.000.
Jeffries, Henry D., Jr.: *See*—
Helwig, William F., Jr.; and Jeffries, Henry D., Jr., 4,163,269, Cl. 361-42.000.
Jenkins, Allen N. Pocket cuspidor. 4,162,547, Cl. 4-259.000.
John O. Butler Company: *See*—
Tarrson, Emanuel B.; and Tisma, Stevan, 4,162,688, Cl. 132-92.00A.
Johnson, Charles B., to International Telephone & Telegraph Corp. Oblique streak tube. 4,163,174, Cl. 315-10.000.
Johnson, Eugene D.: *See*—
Bassett, William W.; and Johnson, Eugene D., 4,162,856, Cl. 366-213.000.
Johnson, George P. Miter clamp. 4,162,785, Cl. 269-41.000.
Johnson, Phillip R., to Dakota Electron, Inc. Tool carrying vehicle with laser control apparatus. 4,162,708, Cl. 172-4.500.
Johnson, Robert E., to Sterling Drug Inc. 1-(Arylamino)pyrroles. 4,163,015, Cl. 260-326.250.
Johnson, Samuel M., to Procter & Gamble Company, The. Fabric care composition containing starch and surfactant. 4,162,983, Cl. 252-8.600.
Johnson, Steven A., to University of Utah. Measurement and reconstruction of three-dimensional fluid flow. 4,162,630, Cl. 73-194.00A.
Johnston, Mack S. Hair clipper. 4,162,574, Cl. 30-29.500.
Jolissaint, Charles H., to Rolm Corporation. Finite storage-time queue. 4,163,124, Cl. 179-18.00D.
Jones, Clifford W. Valve cover. 4,162,740, Cl. 220-85.00P.
Jones, Perry C.: *See*—
McWhorter, Robert D.; and Jones, Perry C., 4,162,917, Cl. 75-130.00R.
Jones, Peter J. V., to Imperial Chemical Industries Limited. Recovering cobalt and bromide catalyst values using a strong anion exchange resin. 4,162,991, Cl. 252-413.000.
Jorgensen, Brian K., to Tektronix, Inc. Lens mount for photographic recording apparatus. 4,162,823, Cl. 350-252.000.
Judd, Oliver S., to Hutson Corporation, The. Composition having improved wear resistant and compression resilient properties. 4,162,900, Cl. 51-295.000.
K-D Manufacturing Company: *See*—
Arnold, Robert L., 4,162,640, Cl. 81-311.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Kamiya, Masaaki, 4,163,193, Cl. 324-29.500.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Sakashita, Masao, 4,162,644, Cl. 84-1.030.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.
Kabushiki Kaisha Meidensha: *See*—
Kubota, Tomiharu, 4,163,279, Cl. 364-105.000.
Kabushiki Kaisha Osaka Packing Seizosho: *See*—
Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.
Kabushiki Kaisha Seikosha: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.
Kabushiki Kaisha Suwa Seikosha: *See*—
Morozumi, Shinji, 4,162,608, Cl. 58-23.00R.
Kaemmerer, Harry, to Americal Telephone and Telegraph. Helical video tape recorder arrangement suitable for high quality editing. 4,163,262, Cl. 360-14.000.
Kahn, Friedhelm. Mechanisms for controlling temperature and heat balance of molds. 4,162,700, Cl. 164-154.000.
Kai, Toshio: *See*—
Tanaka, Junzo; and Kai, Toshio, 4,163,141, Cl. 219-10.55F.
Kaiser, Louis; and Pascal, Charles J., to Uniroyal, Inc. Protective packaging device. 4,162,729, Cl. 206-592.000.
Kajan Specialty Co., Inc.: *See*—
Perkins, Lee E., 4,162,691, Cl. 137-613.000.
Kajiwara, Toshiyuki: *See*—
Shida, Shigeru; and Kajiwara, Toshiyuki, 4,162,627, Cl. 72-247.000.
Kali-Chemie Pharma GmbH: *See*—
Thies, Peter W.; and Asai, Akiji, 4,163,055, Cl. 424-267.000.
Kalliantas, Louis: *See*—
Gonot, Fred P., Jr.; and Kalliantas, Louis, 4,162,800, Cl. 281-42.000.
Kaloi, Cyril M., to United States of America, Navy. Reactively loaded corner fed electric microstrip dipole antennas. 4,163,236, Cl. 343-700.0MS.
Kaluza, Allen M.: *See*—
Sullivan, Bruce M.; and Kaluza, Allen M., 4,162,906, Cl. 55-346.000.
Kambara, Masahiro: *See*—
Morio, Minoru; and Kambara, Masahiro, 4,163,253, Cl. 358-120.000.
Kamin, Gerhard R., to Robert Bosch GmbH. Apparatus for the amplitude discrimination of a video signal. 4,163,251, Cl. 358-107.000.
Kamins, Theodore I.; and Sodini, Charles G., to Hewlett-Packard Company. One-transistor memory cell with enhanced capacitance. 4,163,243, Cl. 357-41.000.
Kaminski, Andrzej: *See*—
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokieki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, to Hitachi, Ltd. Field winding assembly for rotor in electric rotary machine. 4,163,166, Cl. 310-215.000.
Kamiya, Masaaki, to Kabushiki Kaisha Daini Seikosha. Battery voltage detecting apparatus for an electronic timepiece. 4,163,193, Cl. 324-29.500.
Kamyr Inc.: *See*—
Sherman, Michael I.; and Prough, James R., 4,162,933, Cl. 162-17.000.
Kaneko, Hiroshi: *See*—
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.
Kaneko, Katsumi: *See*—
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.
Kanics, Andras, to Mittelmann GmbH & Co. KG. Sealing device for openings of a container which can be loaded with and emptied of batches of fluid loose material, viscous deposits, sludges or the like. 4,162,795, Cl. 277-237.00R.
Kao Soap Co., Ltd.: *See*—
Doi, Tadashi; and Takahashi, Harumi, 4,162,998, Cl. 260-28.00R.
Kasai, Masataka: *See*—
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.
Kashihara, Takanobu: *See*—
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
Kashima, Jiro; and Sato, Synji, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Foundry mold composition and process for producing foundry mold. 4,163,000, Cl. 260-29.60S.
Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, to Hitachi, Ltd. Remote control device for electronic apparatus. 4,163,219, Cl. 340-310.00R.
Katoh, Hisanori, to Inoue Gomu Kogyo Kabushiki Kaisha. Synthetic resin window molding. 4,163,076, Cl. 428-339.000.
Kawada, Sooji. Whole body specified area stimulating therapy device. 4,162,675, Cl. 128-55.000.
Kawai, Hisasi; and Iwase, Kazuo, to Nippon Soken, Inc. Electronic ignition timing control system for internal combustion engines. 4,162,667, Cl. 123-117.00D.
Kawai, Hisasi: *See*—
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
Kawakami, Hiromi: *See*—
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.
Kawatani, Takahiko: *See*—
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.
Kelly, Thomas L. Insulation block and mounting means therefor. 4,162,597, Cl. 52-410.000.
Kelsey, David R., to D. R. K. Limited. Connector assembly for a ball and cord. 4,162,790, Cl. 273-58.00C.
Kemira OY: *See*—
Van der Meer, Arie; and Lepomaa, Lauri A., 4,163,045, Cl. 423-483.000.
Kendall Company, The: *See*—
Patel, Bhupendra C., 4,162,673, Cl. 128-748.000.
Kerr-McGee Corporation: *See*—
Baldwin, Roger A., 4,162,958, Cl. 208-8.0LE.
Clapper, Thomas W., 4,162,965, Cl. 208-177.000.
Leonard, Robert E., 4,162,957, Cl. 208-8.00R.
Leonard, Robert E., 4,162,964, Cl. 208-177.000.
Rhodes, Donald E., 4,162,956, Cl. 208-8.0LE.
Khutoretsky, Garri M.: *See*—
Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.
Kielkiewicz, Jedrzej: *See*—
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokieki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.
Killeen, George F.: *See*—
McGraw, John T.; and Killeen, George F., 4,162,582, Cl. 35-12.00N.
Kincheloe, Jack D. Apparatus for converting a carton or the like into a preselected configuration. 4,162,648, Cl. 93-1.00G.
Kinoshita, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Integrated circuit device. 4,163,245, Cl. 357-51.000.
Kinoshita, Makoto: *See*—
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.
Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, to Oki Electric Industry Co., Ltd. NC tape producing system. 4,163,284, Cl. 364-474.000.
Kita, Takeichi; and Kita, Takuji. H-shaped steel sheet pile wall. 4,162,866, Cl. 405-277.000.
Kita, Takuji: *See*—
Kita, Takeichi; and Kita, Takuji, 4,162,866, Cl. 405-277.000.
Kitahara, Tohru: *See*—
Endo, Akira; and Kitahara, Tohru, 4,163,023, Cl. 260-556.00A.
Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, to Hitachi, Ltd. Magnetic phase shifter control system. 4,163,191, Cl. 323-89.00M.

Klaiber, Raymond W., Jr.: *See*—
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
Klein, Johann, to Bayer Aktiengesellschaft. Instrument for recording blood pressure. 4,162,674, Cl. 128-680.000.
Kleinschmidt, Peter: *See*—
Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.
Klementowski, Frank M.: *See*—
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., 4,163,227, Cl. 340-662.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Herchenbach, Horst, 4,162,922, Cl. 106-100.000.
Klose, George J.: *See*—
Chang, Richard S.; and Klose, George J., 4,162,792, Cl. 273-85.00G.
Knappenberger, George E. Bovine surgical table. 4,162,685, Cl. 119-103.000.
Knopf, Robert J.; and Koleske, Joseph V., to Union Carbide Corporation. Ester diol alkoxylate acrylates. 4,163,113, Cl. 560-185.000.
Knopf, Robert J.: *See*—
Koleske, Joseph V.; and Knopf, Robert J., 4,163,114, Cl. 560-186.000.
Knyazher, Galina B.: *See*—
Litvinov, Pavel I.; Firsov, Vitaly M.; and Knyazher, Galina B., 4,162,921, Cl. 106-39.800.
Kobayashi, Yuichi: *See*—
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.
Kodama, Naoki: *See*—
Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, 4,163,204, Cl. 338-114.000.
Koholka, Richard: *See*—
Schwab, Kurt; and Koholka, Richard, 4,162,820, Cl. 350-36.000.
Koike, Masaru: *See*—
Nakano, Shiro; and Koike, Masaru, 4,163,075, Cl. 428-328.000.
Kolberg Manufacturing Corporation: *See*—
Gellhaus, Derald B., 4,162,968, Cl. 209-400.000.
Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Ester diol alkoxylates. 4,163,114, Cl. 560-186.000.
Koleske, Joseph V.: *See*—
Knopf, Robert J.; and Koleske, Joseph V., 4,163,113, Cl. 560-185.000.
Smith, Oliver W.; and Koleske, Joseph V., 4,163,029, Cl. 525-449.000.
Kolesnikova, Elena N.: *See*—
Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexandr K., 4,162,620, Cl. 66-187.000.
Kolfertz, Erwin. Electromagnetically driven diaphragm pump. 4,162,876, Cl. 417-413.000.
Kollmann, Harry; and Goetsch, Roland H., to Idra AG. Papier-mache coffin and method of making it. 4,162,935, Cl. 162-220.000.
Komagata, Hitoshi: *See*—
Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, to Nippon Telegraph and Telephone Public Corporation. Character recognition system. 4,163,214, Cl. 340-146.3AC.
Komori, Shigehiro: *See*—
Shirahase, Reiji; and Komori, Shigehiro, 4,162,787, Cl. 271-173.000.
Kondo, Kiyosi; and Tunemoto, Daiei, to Sagami Chemical Research Center. Prostaglandin precursors and processes for preparing the same. 4,163,106, Cl. 560-11.000.
Kongo Co. Ltd.: *See*—
Taniwaki, Genshi, 4,162,592, Cl. 49-358.000.
Konicek, Jiri, to Perstorp, AB. Method for removing resin smear in through holes of printed circuit boards. 4,162,932, Cl. 156-630.000.
Konii, Tsuyoshi, to Citizen Watch Co. Ltd. Display device for electronic timepieces. 4,163,230, Cl. 340-765.000.
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Okuda, Hiroji, 4,162,618, Cl. 64-23.000.
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Kraft, Robert E., to FMC Corporation. Vibrating machine suspension. 4,162,778, Cl. 248-610.000.
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Kupper, Willi, to W. Schlafhorst & Co. Buffer storage device for transfering textile coils. 4,162,723, Cl. 198-469.000.
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Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.
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Husson, Alan L.; and Kurland, Marvin, 4,162,719, Cl. 187-29.00R.
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Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.
Kuwakado, Satoshi: *See*—
Shimogawa, Toshiaki; and Kuwakado, Satoshi, 4,162,772, Cl. 242-107.000.
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Dangelmaier, Karl; and Bareis, Alfred, 4,162,734, Cl. 414-27.000.
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Lamprey, Donald F. Hydraulic elevator. 4,162,718, Cl. 187-29.00A.
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Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
Lapointe, Joseph A., to Domtar Inc. Whole tree chipper. 4,162,769, Cl. 241-68.000.
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Briggs, Barry D.; and Lawter, Ray L., 4,162,817, Cl. 339-75.0MP.
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Wright, William R.; Murphy, Theodore; Piazzo, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
Lee, James K.: *See*—
Frank, Lee F.; and Lee, James K., 4,162,832, Cl. 354-51.000.
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Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, to S.A. des Anciens Etablissements Paul Wurth. Pressure equalization apparatus and method. 4,162,784, Cl. 266-176.000.
Lemelson, Jerome H. Manufacturing apparatus. 4,162,757, Cl. 228-1.00R.
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Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., 4,163,108, Cl. 560-121.000.

Kowalchuk, John, 4,162,994, Cl. 252-532.000.

Levine, Alfred B. Electronic calendar and diary. 4,162,610, Cl. 58-148.000.

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Lidman, Sten M.; and Baum, Engelbert, to Alfa-Laval AB. Separator. 4,162,978, Cl. 210-213.000.

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Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.

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Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,163,048, Cl. 424-45.000.

Lind, Hanns; and Moser, Paul, to Ciba-Geigy Corporation. New stabilizers. 4,163,007, Cl. 260-45.75R.

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Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.

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Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.

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Puglisi, Thomas C.; and Strobel, Kurt M., 4,162,878, Cl. 425-152.000.

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Loda, Gary K., to Systems, Science and Software. Sliding spark source cold cathode electron gun and method. 4,163,172, Cl. 313-302.000.

Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, John K., to Ford Motor Company. Rare earth or yttrium, transition metal oxide thermistors. 4,162,631, Cl. 73-362.0AR.

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Cannon, Joseph G.; and Long, John P., 4,163,063, Cl. 424-330.000.

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Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., 4,162,979, Cl. 210-282.000.

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Campbell, Bruce D.; and Lopez, Eugene F., 4,163,117, Cl. 174-74.00A.

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Kresky, Fred C.; Loveland, John H.; and Evans, Bryce B., 4,162,801, Cl. 285-45.000.

Loveless, Charles C., Jr. Solar ice melter for use at low ambient temperatures. 4,162,684, Cl. 119-73.000.

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Holubec, Zenowie M., 4,162,985, Cl. 252-32.70E.

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Reid, Robert; and Lustvee, Kaljo, 4,162,861, Cl. 403-242.000.

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Lynch, John H., to T.I. Silencer Services Limited. Containers for catalysts for exhaust emission control. 4,163,042, Cl. 422-179.000.

Lynch, William M., to AFL Industries, Inc. Water polishing system. 4,162,973, Cl. 210-73.00W.

Ma, Horace Z. Nonimaging radiant energy collector and concentrator. 4,162,824, Cl. 350-293.000.

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Hartung, Harold A., 4,163,067, Cl. 426-573.000.

MacGregor, John J., to Matthey Rustenburg Refiners (Proprietary) Limited. Treatment of effluents. 4,162,950, Cl. 204-149.000.

Mackintosh, Charles. Movable seating method. 4,162,594, Cl. 52-9.000.

MacLean, Allan D., to Polaroid Corporation. Processing apparatus for large format cameras. 4,162,834, Cl. 354-86.000.

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Alles, David S.; Mac Rae, Alfred U.; and Pease, Roger F. W., 4,163,155, Cl. 250-492.00B.

Madland, Thorvald; and Soddy, Thomas C., to Youngstown Steel Door Company, The. Door driver. 4,162,591, Cl. 49-277.000.

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Maeda, Yoshiki; and Maeda, Chikako, 4,162,864, Cl. 405-75.000.

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Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, 4,163,149, Cl. 250-204.000.

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Maehara, Yasuyuki: *See*—
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Maeke, Siegfried; and Rambacher, Paul, to Diamalt Aktiengesellschaft. High purity chenodeoxycholic acid and method for obtaining same. 4,163,017, Cl. 260-397.100.

Maes, Robert H.; and Fontainas, Luc M., to Metallurgie Hoboken-Overpelt. Process for treating lead-copper-sulphur charges. 4,162,915, Cl. 75-14.000.

Magnussen, Peter; Herrmann, Guenter; and Frommer, Elmar, to BASF Aktiengesellschaft. Working-up of reaction mixtures containing cyclohexanol and cyclohexanone. 4,163,027, Cl. 260-586.00P.

Maguire, Edward J., Jr.; and Pancheri, Eugene J., to Procter & Gamble Company, The. Enzyme-containing automatic dishwashing detergent composition. 4,162,987, Cl. 252-135.000.

Mahr, Rene N.: *See*—
Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, 4,162,784, Cl. 266-176.000.

Maioglio, Mauro, to Fabbrica Italiana Magneti Marelli S.p.A. Spark advance apparatus for controlling the ignition instant of a spark plug independent of the magnitude of a power source igniting the spark plug. 4,162,666, Cl. 123-117.00D.

Mairy, Bernard G., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Controlling continuous casting. 4,162,699, Cl. 164-4.000.

Majer, Norbert: *See*—
Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.

Makowski, Alexander G., to Rainville Company, Inc. Interchangeable rotating tables for injection blow molding machines. 4,162,879, Cl. 425-183.000.

Malarkey, Terence D.; and Moreland, William C., II, to White Consolidated Industries, Inc. Cooking vessel capacitive decoupling for induction cooking apparatus. 4,163,139, Cl. 219-10.49R.

Mallory, James D., to Owens-Illinois, Inc. Plural glass forming machines with lehr conveyor. 4,162,911, Cl. 65-229.000.

Mally, Heinz: *See*—
Ransmayr, Wilhelm; and Mally, Heinz, 4,163,036, Cl. 264-12.000.

Malsot, Christian, to Socapex. Multi-channel self-correcting connector. 4,162,816, Cl. 339-64.00M.

Mango, Frank D., to Shell Oil Company. Production of 4,4'-alkyldiene diphenyl diisocyanate. 4,163,019, Cl. 260-453.00P.

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Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

Manning, Michael L.: *See*—
Sturrock, James C., 4,163,271, Cl. 361-93.000.

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Marietta, Walter E., to Parker-Hannifin Corporation. Horsepower summation control for variable displacement. 4,162,874, Cl. 417-216.000.

Marino, Francis C.: *See*—
Bodin, Leslie J.; and Marino, Francis C., 4,163,229, Cl. 340-745.000.

Mark, Victor: *See*—
Hedges, Charles V.; and Mark, Victor, 4,163,116, Cl. 568-723.000.

Marmo, Joseph F., to Gulf Research & Development Company. Cycle oil conversion process. 4,162,961, Cl. 208-57.000.

Maroney, William J.: *See*—
Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.

Marsden, James G.: *See*—
Pepe, Enrico J.; and Marsden, James G., 4,163,073, Cl. 427-221.000.

Marse, Allan V.: *See*—
Anthony, Donald B.; and Marse, Allan V., 4,162,898, Cl. 44-1.00R.

Martin, Claude: *See*—
Demers, Normand; and Martin, Claude, 4,162,750, Cl. 222-250.000.

Martin, Jacob H., to United States of America, Air Force. Interconnection for planar electronic circuits. 4,162,818, Cl. 339-112.00R.

Martin, John R.: *See*—
Block, Robert S.; and Martin, John R., 4,163,254, Cl. 358-122.000.

Marus, Louis J. Safety apparatus for use with a three-phase AC motor. 4,163,270, Cl. 361-77.000.

Maruyama, Takeshi: *See—*
Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, 4,163,219, Cl. 340-310.00R.

Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., to United States of America, Energy. Bearing assembly and the like for use in corrosive and non-corrosive atmospheres. 4,162,813, Cl. 308-237.00R.

Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, to Canon Kabushiki Kaisha. Dual preference camera for digitally displaying preset and computered valves. 4,162,839, Cl. 354-23.00D.

Mason, Ron G.; and Rice, Herbert L., to Emerick, Richard D. Free-flowing, non-charring solid fat useful for popping popcorn. 4,163,066, Cl. 426-99.000.

Masson, Pierre L.: *See—*
Cambiaso, Cesar L.; and Masson, Pierre L., 4,162,895, Cl. 435-7.00B.

Mathewson Corporation: *See—*
Redman, Howard E., 4,162,732, Cl. 414-736.000.

Mathieu, Alain: *See—*
Schmitt, Jean M.; and Mathieu, Alain, 4,162,923, Cl. 106-104.000.

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Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.

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Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Tanaka, Junzo; and Kai, Toshio, 4,163,141, Cl. 219-10.55F.
Tomii, Kaoru; and Hosokawa, Yoshihiro, 4,163,250, Cl. 358-45.000.

Matsuura, Katsuji: *See—*
Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.

Mattel, Inc.: *See—*
Chang, Richard S.; and Klose, George J., 4,162,792, Cl. 273-85.00G.
Cummings, Gary J., 4,162,793, Cl. 273-121.00A.

Mattern, Gunter: *See—*
Frandsen, Erik; Bohtz, Gottfried; and Mattern, Gunter, 4,163,061, Cl. 424-279.000.

Matthey Rustenburg Refiners (Proprietary) Limited: *See—*
MacGregor, John J., 4,162,950, Cl. 204-149.000.

Maurer Engineering, Inc.: *See—*
Nixon, Jeddy D., Jr., 4,162,619, Cl. 64-23.000.

Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.

Maurer, Hans A.: *See—*
Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.

Mayen, Christian: *See—*
Guillemin, Claude; and Mayen, Christian, 4,162,977, Cl. 210-198.00C.

Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., to Motorola, Inc. Biphenyl ester liquid crystal compounds. 4,162,988, Cl. 252-299.000.

McAfee, Loyd O. Vehicle steering knuckle arm angle compensator. 4,162,859, Cl. 403-75.000.

McBride, Thomas W. Exercise tricycle. 4,162,797, Cl. 280-275.000.

McCord, Daniel, to Ideal Industries, Inc. Precision wire stripper. 4,162,638, Cl. 81-9.50R.

McGraw, John T.; and Killeen, George F. Flight trainer and entertainment device for simulating aerial acrobatics. 4,162,582, Cl. 35-12.00N.

McRae, Daniel D., to Harris Corporation. Technique for controlling memoryful non-linearities. 4,163,209, Cl. 340-146.10E.

McWhorter, Robert D.; and Jones, Perry C., to Schuler Industries, Inc. Method and composition for treating molten ferrous metals to produce nodular iron. 4,162,917, Cl. 75-130.00R.

Meacham, G. B. Kirby: *See—*
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.

Mead, Harold C., to Nixdorff Krein Industries, Inc. Tank mounting apparatus for tractors. 4,162,796, Cl. 280-5.00R.

Measurex Corporation: *See—*
Shigemura, Michael S., 4,162,889, Cl. 431-76.000.

Meeks, Merritt R.: *See—*
Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., 4,163,090, Cl. 526-88.000.

Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., to Stauffer Chemical Company. Non-fat dry milk substitute product. 4,163,069, Cl. 426-582.000.

Melchior, Jean. Two-stroke internal combustion engines. 4,162,662, Cl. 123-65.0VD.

Melting Systems, Incorporated: *See—*
Fellnor, John R.; and Love, William J., Jr., 4,162,891, Cl. 432-247.000.

Meneghini, Giovanni: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, 4,162,953, Cl. 204-252.000.

Mengeringhausen, Max; and Schmidek, Reinhard, to MERO-Raumstruktur GmbH & Co. Flange-screw connection for rods in three-dimensional frameworks. 4,162,860, Cl. 403-199.000.

Merck & Co., Inc.: *See—*
Scriabine, Alexander, 4,163,054, Cl. 424-244.000.

Merli, Claudio; and Francia, Carlo, to Euteco S.p.A. Radial pneumatic tires provided with a structure for stiffening the walls. 4,162,698, Cl. 152-354.0RB.

MERO-Raumstruktur GmbH & Co.: *See—*
Mengeringhausen, Max; and Schmidek, Reinhard, 4,162,860, Cl. 403-199.000.

Merz, Ernest J. Automatic wireless tire pressure monitoring system. 4,163,208, Cl. 340-58.000.

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Spies, Johann; and Wohrl, Alfons, 4,163,268, Cl. 361-1.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
Wiesner, Paul; and Stonner, Hans-Martin, 4,162,902, Cl. 55-54.000.

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Maes, Robert H.; and Fontainas, Luc M., 4,162,915, Cl. 75-14.000.

Metrolina Design Group: *See—*
Wright, William V., 4,162,738, Cl. 220-21.000.

Meyer, Ronald A.: *See—*
Anderson, Walter F.; and Meyer, Ronald A., 4,162,746, Cl. 222-153.000.

Meyhall Chemical AG: *See—*
Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., 4,162,925, Cl. 106-208.000.

Meywald, Klaus, to Fritz Eichenauer, Firma. Electrical heating element comprising a helix of wire wound on at least one insulating plate. 4,163,146, Cl. 219-542.000.

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Micheron, Francois, to Thomson-CSF. Bistable electret system. 4,163,162, Cl. 307-400.000.

Micro Consultants Limited: *See—*
Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.

Micropump Corporation: *See—*
Pieters, Ferdinandus A., 4,163,164, Cl. 310-103.000.

Midland-Ross Corporation: *See—*
Schregenberger, Alex J., 4,162,955, Cl. 204-299.0EC.

Mikarai, Makoto, to Asahi Kasei Kogyo Kabushiki-Kaisha; and Japan Steel Works, Ltd., The. Method for producing clad steel pipes. 4,162,758, Cl. 228-131.000.

Miles Laboratories, Inc.: *See—*
Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.

Miller Company, The: *See—*
Van Steenhoven, Frank; and Hirt, Thomas D., 4,162,779, Cl. 248-343.000.

Miller, Frank: *See—*
Westall, Thomas E.; and Miller, Frank, 4,162,600, Cl. 53-120.000.

Miller, Sharon, executrix: *See—*
Miller, Wayne K., deceased; and Miller, Sharon, executrix, 4,162,682, Cl. 119-16.000.

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Miller, William G.: *See—*
Smith, Wayne R.; and Miller, William G., 4,162,845, Cl. 355-14.000.

Milliken Research Corporation: *See—*
Satterfield, Larry S., 4,162,752, Cl. 222-342.000.

Millsap, Robert K. Personnel air cooling device. 4,162,764, Cl. 239-152.000.

Mindler, Albert B.: *See—*
Adams, Ralph C.; Epstein, Arthur C.; Maroney, William J.; and Mindler, Albert B., 4,162,975, Cl. 210-124.000.

Minnesota Mining and Manufacturing Company: *See—*
Antonsen, Stephen A.; and Boaz, David P., 4,163,077, Cl. 428-355.000.

Miskowicz, John S., to Gateway Industries, Inc. Safety buckle with switch. 4,163,128, Cl. 200-61.58B.

Mistry, Kantilal; and Sperber, Martin, to Blonder-Tongue Laboratories, Inc. Subscription television decoder apparatus. 4,163,252, Cl. 358-118.000.

Mita Industrial Company: *See—*
Hisao, Nobuyoshi; and Agui, Takeshi, 4,163,260, Cl. 358-261.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Orii, Katsuo; and Fushima, Haruo, 4,162,717, Cl. 182-48.000.

Mitsubishi Jukogo Kabushiki Kaisha: *See—*
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Exhaust gas cleaning apparatus for an internal combustion engine. 4,162,612, Cl. 60-276.000.

Mittelmann GmbH & Co. KG: *See—*
Kanics, Andras, 4,162,795, Cl. 277-237.00R.

Mitumori, Yoshio: *See—*
Sato, Yukio; Harakawa, Mototaka; and Mitumori, Yoshio, 4,163,223, Cl. 340-384.00R.

Miura, Kenichi, to Fujitsu Limited. Tree-type combinatorial logic circuit. 4,163,211, Cl. 340-146.200.

Miyoshi, Naganori: *See—*
Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.

Mizokami, Akira: *See*—
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.
Mizutani, Koichi: *See*—
Tamura, Tetsuomi; and Mizutani, Koichi, 4,162,613, Cl. 60-278.000.
Mobil Oil Corporation: *See*—
Tabak, Samuel A.; and Morrison, Roger A., 4,163,028, Cl. 585-481.000.
Yan, Tsoung-yuan, 4,162,707, Cl. 166-252.000.
Modulus Corporation: *See*—
Payne, William J., 4,162,573, Cl. 29-705.000.
Moerman, Nathan A. Apparatus for control of electrical current by electromagnetic induction. 4,163,190, Cl. 323-6.000.
Molins Machine Company, Inc.: *See*—
Coburn, Robert E., 4,162,643, Cl. 83-499.000.
Molnar, Sandor; and Rieger, Wolfhart, to Swiss Aluminium Ltd. Polishing foil or polishing plate. 4,162,899, Cl. 51-295.000.
Monier, Jacques F.: *See*—
Buerger, Walter R.; Dixon, Kenneth K.; and Monier, Jacques F., 4,163,212, Cl. 340-146.30H.
Monsanto Company: *See*—
Hintz, Harold J., 4,163,026, Cl. 260-583.00P.
Palethorpe, George, 4,163,089, Cl. 526-80.000.
Wise, Kenneth V., 4,162,992, Cl. 252-456.000.
Monson, Arnold A. Sewage disposal system. 4,162,976, Cl. 210-170.000.
Montedison S.p.A.: *See*—
Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
Montgomery Industries International, Inc.: *See*—
Lewis, Herbert H., 4,162,770, Cl. 241-191.000.
Mookherjee, Braja D.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
Mooney Chemicals, Inc.: *See*—
Alkaitis, Anthony; and Cells, Paul L., 4,162,986, Cl. 252-33.200.
Morcom, Paul J. Mold for plastic collapsible article carrier. 4,162,781, Cl. 249-144.000.
Moreland, William C., II: *See*—
Malarkey, Terence D.; and Moreland, William C., II, 4,163,139, Cl. 219-10.49R.
Morfin-Alvarez, Rafael. Apparatus for crystallizing sugar solution and mother liquors continuously by evaporation. 4,162,927, Cl. 127-16.000.
Mori, Kazuyoshi: *See*—
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.
Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, to Tokyo Shibaura Electric Co., Ltd. Address management system. 4,163,280, Cl. 364-200.000.
Morii, Kokichi; and Haneishi, Kohei, to Sony Corporation. Tuning apparatus for selecting preset broadcast frequencies. 4,163,203, Cl. 334-86.000.
Morino, Seiji: *See*—
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
Morio, Minoru; and Kambara, Masahiro, to Sony Corporation. Method of and apparatus for modifying a video signal to prevent unauthorized recording and reproduction thereof. 4,163,253, Cl. 358-120.000.
Moriya, Michio, to Sumitomo Electric Industries, Ltd. Sliding caliper type disc brake. 4,162,721, Cl. 188-73.300.
Moriya, Yoshiaki: *See*—
Suzuki, Seigo; and Moriya, Yoshiaki, 4,163,291, Cl. 365-221.000.
Morooka, Yasuo; and Tanifuji, Shinya, to Hitachi, Ltd. Tension control method for a rolling mill. 4,162,624, Cl. 72-8.000.
Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece frequency regulating circuit. 4,162,608, Cl. 58-23.00R.
Morrison, Albert, III: *See*—
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.
Morrison, Charles F., Jr., to Vac-Tec Systems, Inc. Planar magnetron sputtering device. 4,162,954, Cl. 204-298.000.
Morrison, Roger A.: *See*—
Tabak, Samuel A.; and Morrison, Roger A., 4,163,028, Cl. 585-481.000.
Morrow, Richard: *See*—
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.
Morse, George W. Pellet mill with improved feed system. 4,162,881, Cl. 425-331.000.
Moser, Paul: *See*—
Lind, Hanns; and Moser, Paul, 4,163,007, Cl. 260-45.75R.
Moser, Roland: *See*—
Seiz, Wolfgang; and Moser, Roland, 4,163,096, Cl. 528-69.000.
Moses, Lawrence L. Handbag with thermal theft protection system. 4,162,695, Cl. 150-35.000.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
Motorola Automobile: *See*—
Thomas, Serge J. H., 4,163,187, Cl. 322-29.000.
Motorola, Inc.: *See*—
Carolus, Walter E.; Cullen, Bryan L.; and Gorcik, Stanley W., 4,163,274, Cl. 361-417.000.
Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., 4,162,988, Cl. 252-299.000.
Moyroud, Louis M. Photographic type composing machine and method. 4,162,846, Cl. 354-10.000.
Mucke, Christoph: *See*—
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
Muhlich, Albert: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.
Muller, Richard, to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik. Balancing machine. 4,162,633, Cl. 73-462.000.
Multivac Sepp Haggenmuller KG: *See*—
Vetter, Arthur, 4,162,884, Cl. 425-388.000.
Munter, Ernst A.; and Ciancibello, Carmine A., to Northern Telecom Limited. Binary multiplier circuit including coding circuit. 4,163,287, Cl. 364-757.000.
Murakami, Hiroyashu: *See*—
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.
Murao, Naofumi: *See*—
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.
Murata Manufacturing Co., Ltd.: *See*—
Tunematu, Toyoaki; Takeno, Seiichi; and Yamaguchi, Testuo, 4,163,202, Cl. 334-76.000.
Murphy, Theodore: *See*—
Wright, William R.; Murphy, Theodore; Piazzo, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Flavoring with terpenyl ethers. 4,163,068, Cl. 426-538.000.
Nabbefeld-Arnold, Erich F.: *See*—
Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., 4,163,024, Cl. 260-566.00R.
Nadelson, Jeffrey, to Sandoz, Inc. Isoxazole-4-carboxamides as tranquilizers, sleep-inducers and muscle relaxants. 4,163,057, Cl. 424-272.000.
Nadler, Morton, to Norprint Limited. Alphanumeric character identification. 4,163,213, Cl. 340-146.30D.
Nakamura, Akio: *See*—
Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, 4,163,204, Cl. 338-114.000.
Nakanishi, Kiyoshi; and Okumura, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with combustion chambers which create a squish and swirl of an air-fuel mixture. 4,162,661, Cl. 123-30.00C.
Nakano, Shiro; and Koike, Masaru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Electric discharge recording material. 4,163,075, Cl. 428-328.000.
Nakashima, Syozi: *See*—
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.
Nakayama, Makoto: *See*—
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.
Nakayama, Tetsuya: *See*—
Hitomi, Shinichi; Nakayama, Tetsuya; and Funabashi, Tetsuji, 4,162,869, Cl. 414-70.000.
Nalco Chemical Company: *See*—
Finch, Robert E., 4,162,966, Cl. 209-166.000.
Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel oxyalkylated polyol prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,163,086, Cl. 521-155.000.
Narita, Hiroshi: *See*—
Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.
National Can Corporation: *See*—
Sauer, Donald G., 4,162,883, Cl. 425-387.100.
National Distillers and Chemical Corporation: *See*—
Van den Bossche, Henri A., 4,163,040, Cl. 422-131.000.
National Presto Industries, Inc.: *See*—
Walker, Duane H.; and Quarderer, Darrell W., 4,162,741, Cl. 220-203.000.
National Semiconductor Corporation: *See*—
Culmer, Daniel D., 4,163,188, Cl. 323-4.000.
NCR Corporation: *See*—
Briggs, Barry D.; and Lawter, Ray L., 4,162,817, Cl. 339-75.0MP.
Neff, Jerry L.: *See*—
Plunkett, Richard A.; Neff, Jerry L.; and Bemish, Timothy A., 4,163,025, Cl. 260-570.900.
Neff, Paul C. Aquarium heater. 4,163,145, Cl. 219-523.000.
Nelson, Carl D., to J. I. Case Company. Vehicle differential control. 4,162,712, Cl. 180-253.000.
Nelson, Harlan I. Label dispenser. 4,162,739, Cl. 221-70.000.

Nelson, Norman A.: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 4,163,110, Cl. 560-121.000.
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., to Bristol-Myers Company. Antibiotic compound. 4,162,938, Cl. 435-75.000.
Neustadt, Bernard R.; and Gold, Elijah H., to Schering Corporation. Anti-hypertensive 5-[2-(substituted anilinoalkylamino)-1-hydroxyalkyl]salicylamides. 4,163,053, Cl. 424-230.000.
Nickel, Horst: *See—*
Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.
Nife-Jungner AB: *See—*
Norling, Sten B. C., 4,163,173, Cl. 313-352.000.
Nippon Electric Co., Ltd.: *See—*
Aomura, Kunio; and Okada, Kenji, 4,163,246, Cl. 357-68.000.
Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.
Nippon Soken, Inc.: *See—*
Kawai, Hisasi; and Iwase, Kazuo, 4,162,667, Cl. 123-117.00D.
Shimogawa, Toshiaki; and Kuwakado, Satoshi, 4,162,772, Cl. 242-107.000.
Nippon Steel Corporation: *See—*
Abe, Seizaburo; Kozima, Masao; and Hosoi, Yuzo, 4,162,930, Cl. 148-38.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Komori, Kazuaki; Kawatani, Takahiko; Kaneko, Hiroshi; and Ishii, Kenichiro, 4,163,214, Cl. 340-146.3AC.
Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.
Nippondenso Co., Ltd.: *See—*
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, to Earth Chemical Company, Limited. Fumigating method and apparatus. 4,163,038, Cl. 422-36.000.
Nissen, Norman C.: *See—*
Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., 4,163,046, Cl. 423-510.000.
Nittner, Erich W. K.: *See—*
Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., 4,162,925, Cl. 106-208.000.
Nixdorff Krein Industries, Inc.: *See—*
Mead, Harold C., 4,162,796, Cl. 280-5.00R.
Nixon, Jeddy D., Jr., to Maurer Engineering, Inc. Drill string shock sub. 4,162,619, Cl. 64-23.000.
Niznik, George E., to General Electric Company. Method for making thermoplastic foams. 4,163,037, Cl. 264-54.000.
Nonogaki, Masahiko, to Elmo Company Limited. Zoom lens assembly with restrictable zooming range. 4,162,822, Cl. 350-187.000.
Norback, Per, to Aktiebolaget Carl Munters. Method of producing sorption bodies. 4,162,934, Cl. 162-155.000.
Norden, James W. Side-lifting apparatus for hopper wagons. 4,162,871, Cl. 414-376.000.
Nordson Corporation: *See—*
Cobbs, Walter H., Jr.; and Stewart, Martin J., 4,162,880, Cl. 425-202.000.
Norling, Sten B. C., to Nife-Jungner AB. Porous electrode body for electrical accumulators. 4,163,173, Cl. 313-352.000.
Norprint Limited: *See—*
Nadler, Morton, 4,163,213, Cl. 340-146.30D.
North American Manufacturing Company: *See—*
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.
Northern Telecom Limited: *See—*
Munter, Ernst A.; and Ciancibello, Carmine A., 4,163,287, Cl. 364-757.000.
Novikov, Nikolai V.: *See—*
Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.
NTN Toyo Bearing Company, Ltd.: *See—*
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.
Nugteren, Diederik H.: *See—*
Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., 4,163,108, Cl. 560-121.000.
Nyberg, Donald W. Method and apparatus for consolidating particle board. 4,162,877, Cl. 425-84.000.
Oberste-Beulmann, Klaus, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Rack apparatus on a face conveyor for a mining machine. 4,162,810, Cl. 299-43.000.
Occidental Oil Shale, Inc.: *See—*
Cha, Chang Y., 4,162,706, Cl. 166-251.000.
Occidental Petroleum Corporation: *See—*
Duraiswamy, Kandaswamy, 4,162,959, Cl. 208-8.00R.
Green, Norman W., 4,162,943, Cl. 201-12.000.
Ochiai, Yoshihito: *See—*
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.
O'Connor, Robert F. Educational teaching and storage system and method. 4,162,581, Cl. 35-8.00R.
Oetjen, Georg; and Eck, David L., to Reliance Electric Company. Load cell. 4,162,628, Cl. 73-141.00A.
Ogawa, Francis T., to Statitrol Division Emerson Electric Co. Alarm condition detecting apparatus and method. 4,163,226, Cl. 340-629.000.
Ohashi, Kenichi: *See—*
Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.
Ohmura, Yoshito: *See—*
Baba, Tatsuo; Ohmura, Yoshito; Fukushima, Hiroshi; and Fukuma, Hideo, 4,163,119, Cl. 179-1.00F.
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, to Kabushiki Kaisha Seikosha. Film display clock. 4,162,609, Cl. 58-38.00R.
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Machara, Yasuyuki; and Shuku, Masanori, to Mitsubishi Jukogo Kabushiki Kaisha. Floating liquid-storage tank having side walls of double-hull construction. 4,162,658, Cl. 114-74.00A.
Okada, Kenji: *See—*
Aomura, Kunio; and Okada, Kenji, 4,163,246, Cl. 357-68.000.
Oki Electric Industry Co., Ltd.: *See—*
Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.
Okuda, Fukuyasu: *See—*
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
Okuda, Hiroji, to Koyo Seiko Company Limited. Device for rolls in high speed rolling mills and the like. 4,162,618, Cl. 64-23.000.
Okumura, Takeshi: *See—*
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,162,661, Cl. 123-30.00C.
Olin Corporation: *See—*
Capuano, Italo A., 4,162,897, Cl. 23-232.00C.
Olin, Paul H.; and Scherbring, David J., to Toro Company, The. Rear wheel support apparatus for a three wheel vehicle. 4,162,605, Cl. 56-7.000.
Oliveau, Olivier: *See—*
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.
Ollendorf, Stanford, to United States of America, National Aeronautics and Space Administration. Thermal control canister. 4,162,701, Cl. 165-32.000.
Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, to Sony Corporation. Voltage supply circuit responsive to plural possible DC input levels. 4,163,278, Cl. 363-101.000.
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, to Copal Company Limited. Focal plane shutter. 4,162,840, Cl. 354-246.000.
Oppenheim, Everett P.: *See—*
Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., 4,162,988, Cl. 252-299.000.
Optical Data System: *See—*
Sutherlin, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.
Orii, Katsuo; and Fushima, Haruo, to Mitsubishi Denki Kabushiki Kaisha. Escape device. 4,162,717, Cl. 182-48.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; and Meneghini, Giovanni, 4,162,953, Cl. 204-252.000.
Orts, Richard J. Peptide compounds and compositions. 4,163,011, Cl. 260-112.50R.
Oshio, Hideki: *See—*
Yagii, Kiyoshi; and Oshio, Hideki, 4,162,948, Cl. 204-80.000.
Oswald, Richard A.: *See—*
Wheeler, Robert V.; and Oswald, Richard A., 4,163,154, Cl. 250-473.000.
Otis Engineering Corporation: *See—*
Heitman, Marshall D.; and Butler, Joe D., 4,162,713, Cl. 180-242.000.
Otsuka Kagaku Yakuhim Kabushiki Kaisha: *See—*
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.
Ott, Karl-Heinz: *See—*
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
Outboard Marine Corporation: *See—*
Ehrlich, Josef, 4,162,663, Cl. 123-75.00B.
Owens-Illinois, Inc.: *See—*
Mallory, James D., 4,162,911, Cl. 65-229.000.
Peters, Homer D. F., 4,162,909, Cl. 65-163.000.
Oxy-Catalyst, Inc.: *See—*
Retallick, William B., 4,162,993, Cl. 252-477.00R.
Pachmayr, Frank A., to Pachmayr Gun Works, Inc. Gun with cushioned grip safety. 4,162,586, Cl. 42-71.00P.
Pachmayr Gun Works, Inc.: *See—*
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Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
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Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.
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Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.
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Petrov, Evgeny I.: *See—*
Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexandr K., 4,162,620, Cl. 66-187.000.
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Cobb, Raymond L., 4,163,014, Cl. 260-326.00C.
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Eisert, Klaus, 4,162,819, Cl. 339-247.000.
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Wright, William R.; Murphy, Theodore; Piazzo, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
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Reinehr, Ulrich; Pieper, Christian; and Kleinschmidt, Peter, 4,163,078, Cl. 428-373.000.
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Steckler, Robert, 4,163,092, Cl. 526-292.000.
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Platt, Albert P., III, deceased, 4,162,848, Cl. 355-14.000.
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Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.
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Stubbings, James H., 4,162,641, Cl. 83-71.000.
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Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.
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DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.
Johnson, Samuel M., 4,162,983, Cl. 252-8.600.
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Prolabo: *See—*
Guillemin, Claude; and Mayen, Christian, 4,162,977, Cl. 210-198.00C.
Prough, James R.: *See—*
Sherman, Michael I.; and Prough, James R., 4,162,933, Cl. 162-17.000.
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Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.
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Kramer, Erich; Nickel, Horst; and Puchner, Fritz, 4,163,012, Cl. 260-182.000.
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Purdy, James A., to Eltra Corporation. Permanent magnet motor. 4,163,165, Cl. 310-154.000.
Quarderer, Darrell W.: *See—*
Walker, Duane H.; and Quarderer, Darrell W., 4,162,741, Cl. 220-203.000.
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Canaris, Valerie M., 4,162,947, Cl. 204-55.00R.
Rabus, Friedrich: *See—*
Grather, Gunter; and Rabus, Friedrich, 4,162,665, Cl. 123-117.00R.
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Rageb, Sam M.: *See—*
Damusis, John A.; and Rageb, Sam M., 4,162,569, Cl. 29-417.000.
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Raines, Robert B.: *See—*
Holland, Maeford J.; and Raines, Robert B., 4,162,886, Cl. 425-556.000.
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Makowski, Alexander G., 4,162,879, Cl. 425-183.000.
Rambacher, Paul: *See—*
Maeke, Siegfried; and Rambacher, Paul, 4,163,017, Cl. 260-397.100.

Ramos, John: *See—*
Ramos, Mario L.; and Ramos, John, 4,162,595, Cl. 52-69.000.
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Rossi, Guglielmo; and Ferloni, Vincenzo, 4,163,129, Cl. 200-81.400.
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Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, to Heraeus Quarzschmelze GmbH. Method of producing synthetic quartz glass, apparatus for the practice of the method, and use of the synthetic quartz glass. 4,162,908, Cl. 65-60.00D.
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Campbell, Bruce D.; and Lopez, Eugene F., 4,163,117, Cl. 174-74.00A.
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Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., 4,163,231, Cl. 343-5.0CM.
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Sutphin, Eldon M., Jr., 4,163,192, Cl. 324-15.000.
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Reliance Electric Company: *See—*
Oetjen, Georg; and Eck, David L., 4,162,628, Cl. 73-141.00A.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,163,185, Cl. 318-601.000.
Retallick, William B., to Oxy-Catalyst, Inc. Metal catalyst support. 4,162,993, Cl. 252-477.00R.
Reuther, Wolfgang: *See—*
Hagen, Helmut; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Fleig, Helmut, 4,163,020, Cl. 260-454.000.
Revo, Valery V.: *See—*
Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
Reynier, Jacques A., to Elmetherm. Heated doors. 4,163,144, Cl. 219-368.000.
Reynolds Metals Company: *See—*
Cudzik, Daniel F., 4,162,743, Cl. 220-270.000.
Reynolds, Reese M.: *See—*
Maze, Robert C.; Oppenheim, Everett P.; and Reynolds, Reese M., 4,162,988, Cl. 252-299.000.
Rhinefrank, Robert A.: *See—*
Calcaterra, Donald J.; Rhinefrank, Robert A.; and Barton, Donald W., 4,162,867, Cl. 408-157.000.
Rhodes, Donald E., to Kerr-McGee Corporation. Coal deashing process having improved solvent recovery techniques. 4,162,956, Cl. 208-8.0LE.
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Gaudard, Yves; Guillemaud, Henri; and Perfetti, Jacques, 4,162,863, Cl. 405-45.000.
Riccio, Pasquale R. Aerosol dispenser utilizing CO_2 as propellant. 4,162,765, Cl. 239-337.000.
Rice, Herbert L.: *See—*
Mason, Ron G.; and Rice, Herbert L., 4,163,066, Cl. 426-99.000.
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, to BASF Aktiengesellschaft. Laminates for the manufacture of flexographic printing plates using block copolymers. 4,162,919, Cl. 96-87.00R.
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Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.
Rieger, Wolfhart: *See—*
Molnar, Sandor; and Rieger, Wolfhart, 4,162,899, Cl. 51-295.000.
Ries, Karl: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.
Righi, Gian P.: *See—*
Parrini, Paolo; Peroni, Giuseppe; Corrieri, Guglielmo; and Righi, Gian P., 4,162,996, Cl. 260-4.00R.
Ringelhan, Helmut: *See—*
Fritsche, Rainer; and Ringelhan, Helmut, 4,163,148, Cl. 250-201.000.
Riordan, Edward D.: *See—*
Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., 4,163,142, Cl. 219-79.000.
Risdon Manufacturing Company: *See—*
Bennett, Robert A., 4,162,749, Cl. 222-633.000.
Bennett, Robert S., 4,162,748, Cl. 222-632.000.
Robert Bosch GmbH: *See—*
Bock, Gerd; Grand, Gerd; and Ilmer, Andreas, 4,163,247, Cl. 358-12.000.
Grather, Gunter; and Rabus, Friedrich, 4,162,665, Cl. 123-117.00R.
Heitmann, Jurgen, 4,163,248, Cl. 358-12.000.
Kamin, Gerhard R., 4,163,251, Cl. 358-107.000.
Wesemeyer, Jurgen; and Haubner, Georg, 4,163,217, Cl. 340-167.00R.
Roberts, Wilbur N.: *See—*
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
Robinson, Ivan M.: *See—*
Heinsohn, George E.; Robinson, Ivan M.; Pruckmayr, Gerfried; and Gilbert, Walter W., 4,163,115, Cl. 560-240.000.
Roche, William J.: *See—*
Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.
Rockwell International Corporation: *See—*
White, Stanley A., 4,163,257, Cl. 358-133.000.
Rockwell-Rimoldi S.p.A.: *See—*
Prandini, Franco, 4,162,657, Cl. 112-101.000.
Rokieki, Gabriel: *See—*
Brzozowski, Zbigniew; Kielkiewicz, Jedrzej; Rokieki, Gabriel; Kaminski, Andrzej; Chomicz, Danuta; and Goraj, Boguskaw, 4,163,087, Cl. 521-176.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Rebel, Herbert; and Simeth, Claus, 4,162,652, Cl. 101-425.000.
Rolfes, J. Kenneth. Latch release device. 4,162,803, Cl. 294-83.00R.
Rollei-Werke Franke & Heidecke: *See—*
Sprung, Jurgen, 4,162,696, Cl. 150-52.00J.
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Jolissaint, Charles H., 4,163,124, Cl. 179-18.00D.
Roloff, Achim: *See—*
Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., 4,163,024, Cl. 260-566.00R.
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Holland, George W.; and Rosen, Perry, 4,163,016, Cl. 260-345.80P.
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Rozmus, John J. Providing solder on electrical contacts. 4,162,572, Cl. 29-630.00D.
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Ruck, Bernard W.: *See—*
Cook, Gerald H.; and Ruck, Bernard W., 4,162,829, Cl. 352-166.000.
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Ruegg, Rudolf: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.
Ryba, Stanley J.: *See—*
Bozdech, Stanley L.; Lipinski, Thomas E.; Allen, John W.; Ryba, Stanley J.; Meacham, G. B. Kirby; Anthony, Charles, Jr.; Pattyn, Dan L.; and Bauer, Frank, 4,162,655, Cl. 110-212.000.
Ryser, Gottlieb: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,163,103, Cl. 542-427.000.
Sablan, Francisco C.: *See—*
Sibley, Clarence E.; and Sablan, Francisco C., 4,162,776, Cl. 244-118.00R.
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Cohen, Sheppard; Paget, Fredrick W.; Roche, William J.; Sadoski, Tadius T.; and Bessone, Carlo S., 4,163,176, Cl. 315-53.000.
Sagami Chemical Research Center: *See*—
Kondo, Kiyosi; and Tunemoto, Daiei, 4,163,106, Cl. 560-11.000.
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Sauer, Gerd, 4,163,195, Cl. 325-313.000.
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Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.
Saito, Toshihisa: *See*—
Ooba, Osamu; Kaneko, Katsumi; Inoue, Nobuyoshi; and Saito, Toshihisa, 4,162,840, Cl. 354-246.000.
Sakai Chemical Industry Company, Ltd.: *See*—
Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.
Sakakibara, Yukio: *See*—
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.
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Ishikawa, Isao; and Sakitani, Yoshio, 4,163,168, Cl. 310-328.000.
Sakurada, Nobuaki: *See*—
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.
Salmond, Kent A.: *See*—
Sutherlin, Kent K.; Crowther, Ted J.; and Salmond, Kent A., 4,163,290, Cl. 365-125.000.
Sampei, Tohru, to Hitachi, Ltd. Audio-frequency power amplifier. 4,163,197, Cl. 330-263.000.
Sanders, James M.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
Sandoz, Inc.: *See*—
Nadelson, Jeffrey, 4,163,057, Cl. 424-272.000.
Sato, Hiroshi: *See*—
Kiwaki, Hisakatsu; Narita, Hiroshi; and Sato, Hiroshi, 4,163,191, Cl. 323-89.00M.
Sato, Synji: *See*—
Kashima, Jiro; and Sato, Synji, 4,163,000, Cl. 260-29.60S.
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Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, 4,163,121, Cl. 179-2.0EB.
Sato, Yukio; Harakawa, Mototaka; and Mitumori, Yoshio. Buzzer with electronic integrated oscillation circuit. 4,163,223, Cl. 340-384.00R.
Satterfield, Larry S., to Milliken Research Corporation. Rotating drum spreader. 4,162,752, Cl. 222-342.000.
Satterwhite, Charles L., to Unit Rig & Equipment Co. Excavating wheel with cam assisted bucket wall ejector. 4,162,584, Cl. 37-190.000.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,163,021, Cl. 260-456.00P.
Sauer, Donald G., to National Can Corporation. Apparatus for thermoforming hollow article having a high L/D ratio. 4,162,883, Cl. 425-387.100.
Sauer, Gerd, to Saint-Gobain Industries. Vehicle antenna and window amplifier. 4,163,195, Cl. 325-313.000.
Sawada, Fred H.; Klementowski, Frank M.; and Bishop, James S., to General Electric Company. Apparatus for monitoring arcing of brushes in a dynamoelectric machine. 4,163,227, Cl. 340-662.000.
Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, to Hitachi, Ltd. Automatic focusing apparatus. 4,163,149, Cl. 250-204.000.
Saxon, Alexandr K.: *See*—
Raevich, Vladimir K.; Petrov, Evgeny I.; Kolesnikova, Elena N.; and Saxon, Alexandr K., 4,162,620, Cl. 66-187.000.
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, to Dynamit Nobel Aktiengesellschaft. Method of preparing modified or unmodified poly-(alkylpentamethyleneterephthalamide). 4,163,101, Cl. 528-347.000.
Schaffner, Carl P.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 4,163,050, Cl. 424-115.000.
Schainberg, Ernst: *See*—
Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.
Schehrer, Rudolf: *See*—
Bachle, Erich; Schehrer, Rudolf; and Hoppner, Dietrich, 4,163,159, Cl. 307-255.000.
Scherbring, David J.: *See*—
Olin, Paul H.; and Scherbring, David J., 4,162,605, Cl. 56-7.000.
Schering Corporation: *See*—
Neustadt, Bernard R.; and Gold, Elijah H., 4,163,053, Cl. 424-230.000.
Scheuneman, James H.; and Trost, John R., to Sperry Rand Corporation. Double bit error correction using double bit complementing. 4,163,147, Cl. 235-312.000.
Schmid Laboratories, Inc.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 4,163,050, Cl. 424-115.000.
Schmidek, Reinhard: *See*—
Mengeringhausen, Max; and Schmidek, Reinhard, 4,162,860, Cl. 403-199.000.
Schmidt, Georg: *See*—
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
Schmidt, Paul; and Walzel, Peter. Pulsed crystallizer with strips of reduced heat exchange. 4,162,617, Cl. 62-123.000.
Schmidt, Robert W., to Texas Instruments Incorporated. Sixteen bit microcomputer memory boards for use with eight bit standard connector bus. 4,163,289, Cl. 365-51.000.
Schmidt, Werner: *See*—
Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.
Schmitt, Frederick L.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
Schmitt, Jean M.; and Mathieu, Alain, to Lafarge Fondu International. Calcium aluminate based refractory hydraulic binder and its process of preparation. 4,162,923, Cl. 106-104.000.
Schmitz, Reinold: *See*—
Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, 4,162,946, Cl. 203-72.000.
Schneeweiss, Peter R.: *See*—
Hetland, Lillian; and Schneeweiss, Peter R., 4,162,751, Cl. 222-293.000.
Schneider, Wolfgang: *See*—
Zondler, Helmut; and Schneider, Wolfgang, 4,163,098, Cl. 528-99.000.
Schregenberger, Alex J., to Midland-Ross Corporation. Electrodeposition coating apparatus. 4,162,955, Cl. 204-299.0EC.
Schroder, Rolf: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,163,052, Cl. 424-200.000.
Schubert & Salzer: *See*—
van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.
Schuler, Gustav, to Filterwerk Mann & Hummel GmbH. Air intake filter with cyclone separator stage. 4,162,905, Cl. 55-337.000.
Schuler Industries, Inc.: *See*—
McWhorter, Robert D.; and Jones, Perry C., 4,162,917, Cl. 75-130.00R.
Schulmeister, Robert: *See*—
Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
Schultz, Jack L., to Grumman Aerospace Corporation. Satellite system. 4,163,235, Cl. 343-100.0SA.
Schulz, Jay R., to Dow Corning Corporation. Self-adhering silicone compositions and preparations thereof. 4,163,081, Cl. 428-429.000.
Schumacher, William L., to AMP Incorporated. Means for in-line connection of optical fiber pairs. 4,162,821, Cl. 350-96.210.
SCHUMAG GmbH: *See*—
Greven, Johann, 4,162,642, Cl. 83-328.000.
Schumann, Fritz: *See*—
van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, 4,162,556, Cl. 15-312.00R.
Schundehutte, Karl H.: *See*—
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.
Schwab, Kurt; and Koholka, Richard, to D. Swarovski & Co. Binocular telescope. 4,162,820, Cl. 350-36.000.
Schwab, Milton I.: *See*—
Spitz, Albert W.; and Schwab, Milton I., 4,162,654, Cl. 110-212.000.
SCM Corporation: *See*—
Turpin, Edward T., 4,163,094, Cl. 528-45.000.
Scriabine, Alexander, to Merck & Co., Inc. Anti-hypertensive compositions. 4,163,054, Cl. 424-244.000.
Sea Containers, Ltd.: *See*—
Clive-Smith, Martin, 4,162,737, Cl. 220-1.500.
Security Patrols Co., Ltd.: *See*—
Iida, Makoto, 4,163,215, Cl. 340-149.00A.
Seehase, Jack C. Tennis racquet having radially arrayed strings. 4,162,791, Cl. 273-73.00D.
Seiler, Erhard: *See*—
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
Seiz, Wolfgang; and Moser, Roland, to Ciba-Geigy Corporation. Epoxy resin mixture for the production of flexible moulded articles. 4,163,096, Cl. 528-69.000.
Seki, Masaki: *See*—
Kishi, Hajimu; Miyoshi, Naganori; and Seki, Masaki, 4,163,284, Cl. 364-474.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kashima, Jiro; and Sato, Synji, 4,163,000, Cl. 260-29.60S.
Nakano, Shiro; and Koike, Masaru, 4,163,075, Cl. 428-328.000.
Selective Feeder Company: *See*—
Brooks, Cletus A., 4,162,683, Cl. 119-51.00R.

Seliger, Robert L.: *See—*
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.

Sentoku, Hideshi: *See—*
Watanabe, Kenkichi; and Sentoku, Hideshi, 4,162,598, Cl. 53-54.000.

Septier, Louis; Dubrous, Francis; and Demange, Michel, to Societe Francaise d'Electrometallurgie Sofrem. Process for the treatment of complex metal ores containing, in particular, manganese and copper, such as oceanic nodules. 4,162,916, Cl. 75-21.000.

Serrano, Francisco de Assis Manuel, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines. Footbridge for connection between a fixed installation and an oscillating installation. 4,162,551, Cl. 14-69.500.

Shell Oil Company: *See—*
Clark, Michael T.; and ten Haken, Pieter, 4,163,062, Cl. 424-324.000.
Mango, Frank D., 4,163,019, Cl. 260-453.00P.

Shepard, Neal F., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; and Shepard, Neal F., Jr., 4,162,928, Cl. 136-89.0PC.

Sheratte, Martin B. Method and composition for reclaiming polyurethane. 4,162,995, Cl. 260-2.300.

Sherman, Michael I.; and Prough, James R., to Kamyr Inc. Exothermic heat as a means of determining the degree of delignification. 4,162,933, Cl. 162-17.000.

Shida, Shigeru; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Rolling mill. 4,162,627, Cl. 72-247.000.

Shigemura, Michael S., to Measurex Corporation. Method and apparatus for control of efficiency of combustion in a furnace. 4,162,889, Cl. 431-76.000.

Shimada, Hiroyuki: *See—*
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Shimizu, Jajimu: *See—*
Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, 4,163,018, Cl. 260-429.900.

Shimizu, Keizo: *See—*
Kato, Takao; Shimizu, Keizo; and Maruyama, Takeshi, 4,163,219, Cl. 340-310.00R.

Shimogawa, Toshiaki; and Kuwakado, Satoshi, to Nippon Soken, Inc. Seat belt retracting and winding device. 4,162,772, Cl. 242-107.000.

Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi; Nakamura, Akio; and Kodama, Naoki, 4,163,204, Cl. 338-114.000.

Shinjo, Katsumi, to Yugenkaisha Shinjo Seikakusho. Component conveying arrangement. 4,162,724, Cl. 198-534.000.

Shinoda, Nobuhiko: *See—*
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; Shinoda, Nobuhiko; and Murakami, Hiroyashu, 4,162,839, Cl. 354-23.00D.

Shirahase, Reiji; and Komori, Shigehiro, to Canon Kabushiki Kaisha. Sheet sorting device. 4,162,787, Cl. 271-173.000.

Shiraogawa, Yukio: *See—*
Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.

Shirasaki, Shinji: *See—*
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, 4,163,282, Cl. 364-431.000.

Shortell, Kenneth R., to Carrcraft Manufacturing Company. Branch tail piece. 4,162,546, Cl. 4-191.000.

Shuku, Masanori: *See—*
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., to Institut Transplantatsii Organov I Tkanei. Artificial heart. 4,162,543, Cl. 3-1.700.

Shuster, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.

Sibley, Clarence E.; and Sablan, Francisco C. Aerial photography camera mount assembly for a helicopter. 4,162,776, Cl. 244-118.00R.

Siemens Aktiengesellschaft: *See—*
Smutny, Kurt, 4,163,189, Cl. 323-6.000.
Stein, Karl-Ulrich, 4,163,242, Cl. 357-41.000.

Simeth, Claus: *See—*
Rebel, Herbert; and Simeth, Claus, 4,162,652, Cl. 101-425.000.

Simmat, Fritz: *See—*
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.

Simmons, David E. Method and apparatus for forming dental copings. 4,162,625, Cl. 72-54.000.

Simmons, Gerald P.: *See—*
Grooss, Frank A.; and Simmons, Gerald P., 4,162,872, Cl. 414-713.000.

Simoneit, Gunter: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

Singer Company, The: *See—*
Coughenour, Donald J.; Brown, Jack; and Herr, John A., 4,163,158, Cl. 250-561.000.

Sinner, Helmut: *See—*
Kunzel, Hans E.; Bernert, Claus-Rudiger; Arend, Gunter; Bentz, Francis; Sinner, Helmut; and Brokmeier, Dieter, 4,163,088, Cl. 525-433.000.

Sjogren, Alan L.: *See—*
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.

Sjogren, Fred E., to Sjogren, Kenneth A.; Sjogren, Alan L.; and Sjogren, Glenda J., part interest to each. Log truck scale pad and pop-off valve. 4,162,710, Cl. 177-141.000.

Sjogren, Glenda J.: *See—*
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.

Sjogren, Kenneth A.: *See—*
Sjogren, Fred E., 4,162,710, Cl. 177-141.000.

Skerlos, Peter C., to Zenith Radio Corporation. Windowed tuning system with synchronous detector. 4,163,259, Cl. 358-191.000.

Sloan, Kenneth B.: *See—*
Stella, Valentino J.; and Sloan, Kenneth B., 4,163,058, Cl. 424-273.00R.

Smirnov, Boris A.: *See—*
Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.

Smith, Charles A.; and Adams, Clair S., to Sperry Rand Corporation. Bale thrower. 4,162,725, Cl. 198-628.000.

Smith, Hinchman & Grylls Associates, Inc.: *See—*
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.

Smith, Jack F.: *See—*
Descovich, Theodore; Smith, Jack F.; and Riordan, Edward D., 4,163,142, Cl. 219-79.000.

Smith, Oliver W.; and Koleske, Joseph V., to Union Carbide Corporation. High solids coating compositions. 4,163,029, Cl. 525-449.000.

Smith, Raymond E., Jr. Extensible boom lift. 4,162,873, Cl. 414-718.000.

Smith, Wayne R.; and Miller, William G., to Xerox Corporation. Copier for greater than standard length documents. 4,162,845, Cl. 355-14.000.

Smutny, Kurt, to Siemens Aktiengesellschaft. Transformer with a ferromagnetic core for d-c and a-c signals. 4,163,189, Cl. 323-6.000.

Socapex: *See—*
Malsot, Christian, 4,162,816, Cl. 339-64.00M.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Buzio, Pierpaolo; and Edefonti, Lucio, 4,163,080, Cl. 428-424.000.

S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard; Mahr, Rene N.; and Heinz, Carlo, 4,162,784, Cl. 266-176.000.

Societe Anonyme dite: F.M.C.: *See—*
Tribout, Michel, 4,162,952, Cl. 204-224.00R.

Societe Anonyme Roure Bertrand Dupont: *See—*
Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, 4,163,109, Cl. 560-122.000.

Societe d'Etudes et de Participation O.H.F.: *See—*
Aubin, Michel F., 4,163,049, Cl. 424-59.000.

Societe Francaise d'Electrometallurgie Sofrem: *See—*
Septier, Louis; Dubrous, Francis; and Demange, Michel, 4,162,916, Cl. 75-21.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Caruel, Jacques E. J.; Bedue, Jean R.; Deroide, Bruno; Gaillac, Jean-Paul R.; and Gastebois, Philippe M. D., 4,162,611, Cl. 60-39.650.

Societe Nationale Elf Aquitaine (Production): *See—*
Blanc, Claude; Chenard, Jean-Yves; Delpuech, Jean-Jacques; and Oliveau, Olivier, 4,162,903, Cl. 55-73.000.

Soddy, Thomas C.: *See—*
Madland, Thorvald; and Soddy, Thomas C., 4,162,591, Cl. 49-277.000.

Sodini, Charles G.: *See—*
Kamins, Theodore I.; and Sodini, Charles G., 4,163,243, Cl. 357-41.000.

Sony Corporation: *See—*
Ebihara, Norio; and Tatsuzawa, Kaichi, 4,163,258, Cl. 358-167.000.
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.
Morii, Kokichi; and Haneishi, Kohei, 4,163,203, Cl. 334-86.000.
Morio, Minoru; and Kambara, Masahiro, 4,163,253, Cl. 358-120.000.
Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.

Soos, Nicholas A., to Bell Telephone Laboratories, Incorporated. Encapsulation of circuits. 4,163,072, Cl. 427-96.000.

Sorensen, Fleming: *See—*
DeBlock, Frans; Goffinet, Pierre C. E.; and Sorensen, Fleming, 4,162,984, Cl. 252-8.800.

Sorenson, Hal K.: *See—*
Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K., 4,162,766, Cl. 239-656.000.

Specialized Products, Inc.: *See—*
Spurling, Gary A., 4,162,857, Cl. 366-261.000.

Spectroderm International, Inc.: *See—*
Bender, Charles E., 4,162,855, Cl. 366-274.000.

Sperber, Martin: *See—*
Mistry, Kantilal; and Sperber, Martin, 4,163,252, Cl. 358-118.000.

Sperry Rand Corporation: *See*—
Scheuneman, James H.; and Trost, John R., 4,163,147, Cl. 235-312.000.
Smith, Charles A.; and Adams, Clair S., 4,162,725, Cl. 198-628.000.
Spielau, Paul: *See*—
Kuhnel, Werner; and Spielau, Paul, 4,163,085, Cl. 521-96.000.
Spies, Johann; and Wohrl, Alfons, to Messerschmitt-Bolkow-Blohm GmbH. Circuit arrangement for monitoring readiness for operation of actuating devices of a safety apparatus for vehicles. 4,163,268, Cl. 361-1.000.
Spiess, Karl, to Industriewerk Schaeffler OHG. Apparatus for universal joint assembly. 4,162,568, Cl. 29-281.300.
Spitz, Albert W.; and Schwab, Milton I., to Trio Process Corporation. Pollution controlled incineration system. 4,162,654, Cl. 110-212.000.
Spivack, John D., to Ciba-Geigy Corporation. Compositions stabilized with polyalkylthiobenzenes. 4,163,006, Cl. 260-45.8NT.
Spivey, Bron W., to Akzona Incorporated. Entangled yarns. 4,162,607, Cl. 57-287.000.
Sprung, Jurgen, to Rollei-Werke Franke & Heidecke. Support for a camera. 4,162,696, Cl. 150-52.00J.
Spurling, Gary A., to Specialized Products, Inc. Apparatus for stirring grain. 4,162,857, Cl. 366-261.000.
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., to Smith, Hinchman & Grylls Associates, Inc. Illumination measurement device. 4,162,853, Cl. 356-225.000.
Stach, Leonard J., to Velsicol Chemical Corporation. O-alkoxy- and alkylthiophenyl carbamates. 4,163,112, Cl. 560-132.000.
Stackpole Carbon Company: *See*—
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., 4,163,167, Cl. 310-242.000.
Standard Oil Company, The: *See*—
Anthony, Donald B.; and Marse, Allan V., 4,162,898, Cl. 44-1.00R.
Standard Oil Company (Indiana): *See*—
Kvapil, Rudolph; and Clews, K. Malcolm, 4,162,808, Cl. 299-2.000.
Standard Products Company, The: *See*—
Dallen, John A.; and Green, Harry W., 4,162,656, Cl. 110-221.000.
Stangeland, Bruce E., to Chevron Research Company. Sequential hydrocracking and hydrogenating process for lube oil production. 4,162,962, Cl. 208-58.000.
Stankewitz, Hans-Werner, to Ernst Leitz Wetzlar GmbH. Process and apparatus for automatically realizing Kohler's principle of illumination. 4,163,150, Cl. 250-205.000.
Stanley, Robert K. Method and apparatus for stuffer crimping strand material. 4,162,564, Cl. 28-248.000.
Stannard, Steven M.: *See*—
Squillace, Stephen S.; DiLaura, David L.; and Stannard, Steven M., 4,162,853, Cl. 356-225.000.
Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D. Invalid feeding device. 4,162,868, Cl. 414-9.000.
Statitrol Division Emerson Electric Co.: *See*—
Ogawa, Francis T., 4,163,226, Cl. 340-629.000.
Stauffer Chemical Company: *See*—
Melachouris, Nicholas; Fracaroli, Brenda B.; and Corbett, Constance R., 4,163,069, Cl. 426-582.000.
Stearnes, Robert: *See*—
Davis, McKinley D.; Stearnes, Robert; and Carter, Lemuel, Jr., 4,162,650, Cl. 99-419.000.
Steckler, Robert, to Plastomedical Sciences, Inc. Cationic hydrogels based on hydroxyalkyl acrylates and methacrylates. 4,163,092, Cl. 526-292.000.
Steen, Donald B., to United States of America, Navy. High current switches using multi-louvered contact strips. 4,163,135, Cl. 200-158.000.
Steere, Marjorie S.: *See*—
Steere, William H., Jr.; and Steere, Marjorie S., 4,162,730, Cl. 211-118.000.
Steere, William H., Jr.; and Steere, Marjorie S. Portable article hanger. 4,162,730, Cl. 211-118.000.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. MOS storage integrated circuit using individual FET elements. 4,163,242, Cl. 357-41.000.
Steinmueller, Ralph E., to Harry W. Dietert Co. Load cell. 4,162,632, Cl. 73-432.00A.
Stella, Valentino J.; and Sloan, Kenneth B., to INTERX Research Corporation. Derivatives of 5,5-diphenylhydantoin exhibiting enhanced solubility and the therapeutic use thereof. 4,163,058, Cl. 424-273.00R.
Stendel, Wilhelm: *See*—
Enders, Edgar; Hammann, Ingeborg; Brandes, Wilhelm; Kraus, Peter; and Stendel, Wilhelm, 4,163,059, Cl. 424-277.000.
Sterling Drug Inc.: *See*—
Johnson, Robert E., 4,163,015, Cl. 260-326.250.
Stewart, David B., to Wm. R. Stewart & Sons (Hacklemakers) Limited. Carding apparatus. 4,162,559, Cl. 19-113.000.
Stewart, Martin J.: *See*—
Cobbs, Walter H., Jr.; and Stewart, Martin J., 4,162,880, Cl. 425-202.000.
Stocke, John P., to AM International, Inc. Corona discharge apparatus and method having means for improved mounting of corona discharge wire. 4,163,273, Cl. 361-229.000.
Stone, Aidan M., to General Electric Company. Basket overflow for water recirculating washing machine. 4,162,621, Cl. 68-23.200.
Stone City Products, Inc.: *See*—
Rankin, Armand T., 4,162,780, Cl. 249-127.000.
Stonner, Hans-Martin: *See*—
Wiesner, Paul; and Stonner, Hans-Martin, 4,162,902, Cl. 55-54.000.
Storm, Donald W. Horizontal stacker for baked goods and the like. 4,162,870, Cl. 414-107.000.
Stormer, Horst L.: *See*—
Dingle, Raymond; Gossard, Arthur C.; and Stormer, Horst L., 4,163,237, Cl. 357-16.000.
Stringa, Luigi, to Elettronica San Giorgio Elsag S.p.A. Method and apparatus for the rotation of a binary-data matrix, intended particularly to be used as a storage unit having a two-way access mode for electronic computers. 4,163,281, Cl. 364-200.000.
Strobel, Kurt M.: *See*—
Puglisi, Thomas C.; and Strobel, Kurt M., 4,162,878, Cl. 425-152.000.
Stromberg, Nils E., to Sunds Aktiebolag. Method and apparatus for transforming by pressing voluminous material into bales. 4,162,603, Cl. 53-438.000.
Stubbings, James H., to Potomac Applied Mechanics, Inc. Automatic loading and unloading for numerically controlled turret punch. 4,162,641, Cl. 83-71.000.
Studiengesellschaft Kohle mbH.: *See*—
Heimbach, Paul; Roloff, Achim; and Nabbefeld-Arnold, Erich F., 4,163,024, Cl. 260-566.00R.
Sturmann, Klaus A.: *See*—
Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., 4,162,979, Cl. 210-282.000.
Sturrock, James C., to Manning, Michael L. Electronic switching apparatus. 4,163,271, Cl. 361-93.000.
Subramanian, Kohur N.; Illis, Alexander; and Nissen, Norman C., to International Nickel Company, Inc., The. Recovery of selenium. 4,163,046, Cl. 423-510.000.
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Takahashi, Sadao; and Sudo, Toshio, 4,163,201, Cl. 333-194.000.
Sugawara, Hiroyuki: *See*—
Kubota, Yoshiyuki; Kurosawa, Yukio; and Sugawara, Hiroyuki, 4,163,130, Cl. 200-144.00B.
Suh, Byoung I.: *See*—
Erickson, Wallace A.; and Suh, Byoung I., 4,163,004, Cl. 260-42.140.
Sullivan, Bruce M.; and Kaluza, Allen M., to Donaldson Company, Inc. Side outlet tube. 4,162,906, Cl. 55-346.000.
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Moriya, Michio, 4,162,721, Cl. 188-73.300.
Summers, Frank B., to Fabreeka Products Company. Conveyor belt. 4,162,727, Cl. 198-688.000.
Sunds Aktiebolag: *See*—
Stromberg, Nils E., 4,162,603, Cl. 53-438.000.
Superior Electric Company, The: *See*—
Leenhouts, Albert C., 4,163,184, Cl. 318-573.000.
Sutherlin, Kent K.; Crowther, Ted J.; and Salmond, Kent A., to Optical Data System. Holographic verification system with indexed memory. 4,163,290, Cl. 365-125.000.
Sutphin, Eldon M., Jr., to RCA Corporation. Ignition spark zone duration circuit. 4,163,192, Cl. 324-15.000.
Suzuki, Arata, to Capintec Inc. Pencil-shaped radiation detection ionization chamber. 4,163,152, Cl. 250-374.000.
Suzuki, Seigo; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Input-output control circuit for FIFO memory. 4,163,291, Cl. 365-221.000.
Suzuki, Tetsuro: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,162,609, Cl. 58-38.00R.
Suzuki, Yasuo: *See*—
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,162,576, Cl. 32-40.00R.
Swartz, John M.: *See*—
Swinehart, Philip R.; and Swartz, John M., 4,163,240, Cl. 357-29.000.
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Molnar, Sandor; and Rieger, Wolfhart, 4,162,899, Cl. 51-295.000.
Pryor, Michael J., 4,163,083, Cl. 428-472.000.
Sybron Corporation: *See*—
Van der Beck, Roland R.; and Chapman, James W., 4,162,826, Cl. 350-319.000.
Systems, Science and Software: *See*—
Loda, Gary K., 4,163,172, Cl. 313-302.000.
Szucs, Laslo: *See*—
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.
T.I. Silencer Services Limited: *See*—
Lynch, John H., 4,163,042, Cl. 422-179.000.
Tabak, Samuel A.; and Morrison, Roger A., to Mobil Oil Corporation. Xylene isomerization. 4,163,028, Cl. 585-481.000.
Tabatchnik-Michaeli, Baruch. Lighting means, especially headlights of vehicles. 4,163,276, Cl. 362-255.000.
Tada, Fusao; Shimizu, Jajimu; Asaoka, Tsutomu; and Matsumoto, Fuminori, to Sakai Chemical Industry Company, Ltd. Process for preparing metal salts of alkyl phosphates. 4,163,018, Cl. 260-429.900.
Takahashi, Akio, to Hooker Chemicals & Plastics Corp. Method of polymerizing vinyl halide with olefin polymers and copolymers and compositions thereof. 4,163,033, Cl. 525-53.000.
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Kubo, Kazuhiko; Takahashi, Akira; and Ohashi, Kenichi, 4,162,924, Cl. 106-120.000.

Takahashi, Harumi: *See—*
Doi, Tadashi; and Takahashi, Harumi, 4,162,998, Cl. 260-28.00R.

Takahashi, Ken: *See—*
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Takahashi, Shigenori: *See—*
Onoue, Yoshinori; Matsuura, Katsuji; and Takahashi, Shigenori, 4,163,278, Cl. 363-101.000.

Takata, Akira: *See—*
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.

Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, to NTN Toyo Bearing Company, Ltd. Rotary bearing assembly. 4,162,812, Cl. 308-172.000.

Takeda Chemical Industries, Ltd.: *See—*
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,162,940, Cl. 435-119.000.

Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, to Lion Hamigaki Kabushiki Kaisha. Appliances for treating teeth. 4,162,576, Cl. 32-40.00R.

Takeno, Seiichi: *See—*
Tunematu, Toyoaki; Takeno, Seiichi; and Yamaguchi, Testuo, 4,163,202, Cl. 334-76.000.

Talcott, Thomas D., to Dow Corning Corporation. Blood bag having CO_2 absorbent therein. 4,162,676, Cl. 128-214.00D.

Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, to Hitachi, Ltd. Magnetic tape scanning assembly for use in video tape recorder and playback apparatus. 4,163,266, Cl. 360-84.000.

Tamura, Hifumi; and Ishitani, Tohru, to Hitachi, Ltd. Ion beam means. 4,163,153, Cl. 250-423.00R.

Tamura, Tetsuomi; and Mizutani, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier of an internal combustion engine. 4,162,613, Cl. 60-278.000.

Tanaka, Hideo: *See—*
Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, 4,163,111, Cl. 560-122.000.

Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,163,141, Cl. 219-10.55F.

Tanida, Seiichi: *See—*
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,162,940, Cl. 435-119.000.

Tanifuji, Shinya: *See—*
Morooka, Yasuo; and Tanifuji, Shinya, 4,162,624, Cl. 72-8.000.

Tanikoshi, Kinji, to Canon Kabushiki Kaisha. Actuating circuit for D.C. motor. 4,163,182, Cl. 318-331.000.

Taniwaki, Genshi, to Kongo Co. Ltd. Sliding door. 4,162,592, Cl. 49-358.000.

Tappe, Gunter: *See—*
Pohl, Werner; Schainberg, Ernst; Schmidt, Werner; and Tappe, Gunter, 4,163,002, Cl. 260-40.00R.

Tarrson, Emanuel B.; and Tisma, Stevan, to John O. Butler Company. Medicating floss dispenser and method of applying medication to human teeth. 4,162,688, Cl. 132-92.00A.

Tashiro, Norio, to Tokyo Shibaura Electric Co., Ltd. Magnetron for which leakage of H.F. noise is minimized. 4,163,175, Cl. 315-39.510.

Tasnadi, Csaba: *See—*
Hofstede, Marinus J.; Beentjes, Gerardus; Szucs, Laslo; and Tasnadi, Csaba, 4,162,945, Cl. 202-173.000.

Tatsuzawa, Kaichi: *See—*
Ebihara, Norio; and Tatsuzawa, Kaichi, 4,163,258, Cl. 358-167.000.

Tauskey, William A., Sr.: *See—*
Infield, Harold B.; Morrison, Albert, III; and Tauskey, William A., Sr., 4,162,686, Cl. 122-149.000.

Taylor, Richard J.: *See—*
Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.

Technical Operations, Incorporated: *See—*
Wheeler, Robert V.; and Oswald, Richard A., 4,163,154, Cl. 250-473.000.

Technicon Instruments Corporation: *See—*
Cambiaso, Cesar L.; and Masson, Pierre L., 4,162,895, Cl. 435-7.00B.

Teisseire, Paul J.; Plattier, Marcel; and Giraudi, Edouard, to Societe Anonyme Roure Bertrand Dupont. Process for the preparation of cyclic ketones. 4,163,109, Cl. 560-122.000.

Tektronix, Inc.: *See—*
Jorgensen, Brian K., 4,162,823, Cl. 350-252.000.

Teleglobe Pay-TV System, Inc.: *See—*
Pires, H. George, 4,163,255, Cl. 358-122.000.

Ten Broeck, Dale K.; Cuson, Stanley N.; and Sorenson, Hal K. Vehicular spreader for icy roads and the like. 4,162,766, Cl. 239-656.000.

ten Haken, Pieter: *See—*
Clark, Michael T.; and ten Haken, Pieter, 4,163,062, Cl. 424-324.000.

Terada, Toshimichi: *See—*
Tamamura, Takeo; Asahi, Naotatsu; Nakayama, Makoto; Kasai, Masataka; Saito, Akira; and Terada, Toshimichi, 4,163,266, Cl. 360-84.000.

Terschuren, Wolfgang: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,162,636, Cl. 73-638.000.

Tetenborg, Konrad: *See—*
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, 4,162,602, Cl. 53-415.000.

Texaco Development Corp.: *See—*
Yeakey, Ernest L.; and Waddill, Harold G., 4,162,931, Cl. 156-331.000.

Texaco Inc.: *See—*
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,162,989, Cl. 252-312.000.

Texas Instruments Incorporated: *See—*
Adcock, Willis A., 4,163,256, Cl. 358-127.000.
Boulanger, Henry J., 4,163,125, Cl. 200-5.00A.
Carter, David L., 4,163,239, Cl. 357-24.000.
Schmidt, Robert W., 4,163,289, Cl. 365-51.000.

Thelen, Bernd; Majer, Norbert; Schmitz, Reinold; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Process for concentrating halogenoanthraquinones. 4,162,946, Cl. 203-72.000.

Thermo-Couple Products Company, Inc.: *See—*
Finney, Philip F., 4,162,929, Cl. 136-233.000.

Thies, Peter W.; and Asai, Akiji, to Kali-Chemie Pharma GmbH. 2,9-Dioxatricyclo[4,3,1,$0^{3,7}$] decane derivatives and pharmaceutical compositions thereof. 4,163,055, Cl. 424-267.000.

Thomas, Serge J. H., to Motorola Automobile. Alternator having single stator with dual windings and compound output. 4,163,187, Cl. 322-29.000.

Thompson, Stanley C. Golf club head sole plate with studs interlocking to head laminations. 4,162,794, Cl. 273-174.000.

Thomsen, Jack W., to Weckessar Company, Inc. Spacer support for panel members. 4,162,560, Cl. 24-73.00P.

Thomson-CSF: *See—*
Micheron, Francois, 4,163,162, Cl. 307-400.000.

Thornton, John N., to Wiggins Teape Limited. Sheet stack divider. 4,162,649, Cl. 93-93.00D.

Thorsen, Elmer J., Jr.: *See—*
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., 4,162,728, Cl. 206-345.000.

Three Sisters Ranch Enterprises: *See—*
Faulstich, George W., 4,162,736, Cl. 215-256.000.

Tiefenthaler, Karl H. O.; and Nittner, Erich W. K., to Meyhall Chemical AG. Phosphated locust bean gums. 4,162,925, Cl. 106-208.000.

Tillemans, Jacobus H., to U.S. Philips Corporation. Strain-relief device for a cable. 4,162,561, Cl. 24-129.00R.

Tisma, Stevan: *See—*
Tarrson, Emanuel B.; and Tisma, Stevan, 4,162,688, Cl. 132-92.00A.

Toibana, Yasuo: *See—*
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.

Tokico Ltd.: *See—*
Haraikawa, Tetsuo, 4,162,720, Cl. 188-71.900.
Hayashida, Yoshihiro, 4,162,616, Cl. 60-533.000.

Tokuhara, Masaharu: *See—*
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.

Tokuno, Masateru, to Rengo Co., Ltd. Object locating apparatus. 4,163,185, Cl. 318-601.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Ishihara, Taketoshi; and Watanabe, Yosiaki, 4,162,852, Cl. 356-125.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Ishii, Kazuo, 4,163,264, Cl. 360-68.000.
Kinoshita, Hiroyuki, 4,163,245, Cl. 357-51.000.
Mori, Ryuichi; Ichikawa, Tadao; and Shiraogawa, Yukio, 4,163,280, Cl. 364-200.000.
Suzuki, Seigo; and Moriya, Yoshiaki, 4,163,291, Cl. 365-221.000.
Takahashi, Sadao; and Sudo, Toshio, 4,163,201, Cl. 333-194.000.
Tashiro, Norio, 4,163,175, Cl. 315-39.510.

Tomii, Kaoru; and Hosokawa, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Index tube color television system with deflection rate error correction. 4,163,250, Cl. 358-45.000.

Tomikawa, Hirohisa: *See—*
Okabe, Toshimasa; Shimada, Hiroyuki; Hanano, Toshio; Murao, Naofumi; Mori, Kazuyoshi; Tomikawa, Hirohisa; Mizokami, Akira; Maehara, Yasuyuki; and Shuku, Masanori, 4,162,658, Cl. 114-74.00A.

Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, to Otsuka Kagaku Yakuhim Kabushiki Kaisha. 2-Cyclopentenone derivatives. 4,163,111, Cl. 560-122.000.

Toro Company, The: *See—*
Olin, Paul H.; and Scherbring, David J., 4,162,605, Cl. 56-7.000.

Toyoda, Noriyuki: *See—*
Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, 4,162,939, Cl. 435-254.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,162,661, Cl. 123-30.00C.
Tamura, Tetsuomi; and Mizutani, Koichi, 4,162,613, Cl. 60-278.000.

Trachtman, Joseph N. Apparatus and methods for directly measuring the refraction of the eye. 4,162,828, Cl. 351-9.000.

Traister, Robert L.; and Wilczek, Stephen P., to Xerox Corporation. Reproduction machine with duplex image shift. 4,162,844, Cl. 355-14.000.

Traitement de l'Information et Techniques Nouvelles: *See*—
Guignard, Claude F.; and Perrette, Bernard J., 4,163,157, Cl. 250-561.000.
Trautner, Kersten: *See*—
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.
Treanor, Charles E., to Calspan Corporation. Thermal-radiation excited vibrational-exchange pumped laser generator. 4,163,199, Cl. 331-94.50G.
Treber, Norbert: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, 4,162,908, Cl. 65-60.00D.
Trepanier, Donald L.: *See*—
Britton, Thomas C.; and Trepanier, Donald L., 4,163,104, Cl. 544-160.000.
Triad & Associates, Inc.: *See*—
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, 4,162,635, Cl. 73-623.000.
Tribble, William R., to Phillips Petroleum Company. Positive shut-off for catalyst feed system. 4,162,894, Cl. 23-230.00A.
Tribout, Michel, to Societe Anonyme dite: F.M.C. Apparatus for electrolysis by projection. 4,162,952, Cl. 204-224.00R.
Trio Process Corporation: *See*—
Spitz, Albert W.; and Schwab, Milton I., 4,162,654, Cl. 110-212.000.
Triple Cuff Corporation: *See*—
Daleo, Joseph, 4,162,622, Cl. 70-16.000.
Triplett, William C.; Brauer, Walter H.; Burke, Robert; and Morrow, Richard, to Triad & Associates, Inc. System for monitoring the condition of a pipeline. 4,162,635, Cl. 73-623.000.
Trittipoe, Jack H., to Caterpillar Tractor Co. Method and apparatus for separating a fitting from a tube. 4,162,570, Cl. 29-427.000.
Trost, John R.: *See*—
Scheuneman, James H.; and Trost, John R., 4,163,147, Cl. 235-312.000.
Trump, Martin R.: *See*—
Michael, Peter C.; Taylor, Richard J.; and Trump, Martin R., 4,163,249, Cl. 358-21.00R.
Tsai, Keh-Chi; and Littauer, Ernest L., to Lockheed Missiles & Space Company, Inc. Electrochemically stable cathode. 4,163,084, Cl. 429-206.000.
Tsaknis, Peter J.: *See*—
Lux, Virginia J.; and Tsaknis, Peter J., 4,162,875, Cl. 366-273.000.
Tscherwitschke, Richard; and Henig, Hans. Electroplating apparatus with selectively interchangeable, connectable drums. 4,162,951, Cl. 204-213.000.
Tsu, Raphael: *See*—
Esaki, Leo; and Tsu, Raphael, 4,163,238, Cl. 357-17.000.
Tsukumo, Shinsuke: *See*—
Takata, Toshiyasu; Takata, Akira; and Tsukumo, Shinsuke, 4,162,812, Cl. 308-172.000.
Tsunoda, Yoshito: *See*—
Sawano, Susumu; Tsunoda, Yoshito; and Maeda, Takeshi, 4,163,149, Cl. 250-204.000.
Tucker, Robert C., Jr.: *See*—
Weatherly, Merle H.; and Tucker, Robert C., Jr., 4,163,071, Cl. 427-34.000.
Tunematu, Toyoaki; Takeno, Seiichi; and Yamaguchi, Testuo, to Murata Manufacturing Co., Ltd. Tuning apparatus and method of producing the same. 4,163,202, Cl. 334-76.000.
Tunemoto, Daiei: *See*—
Kondo, Kiyosi; and Tunemoto, Daiei, 4,163,106, Cl. 560-11.000.
Turnier, Gerard. Swimming and exercising apparatus. 4,162,788, Cl. 272-71.000.
Turpin, Edward T., to SCM Corporation. Heat curing water soluble homopolyurethanes. 4,163,094, Cl. 528-45.000.
Uetsuki, Tsuneo: *See*—
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,163,074, Cl. 427-229.000.
Ullrich, Martin, to Bayer Aktiengesellschaft. Multi-shaft screw extruder. 4,162,854, Cl. 366-83.000.
Umeda, Naoki: *See*—
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
Umehara, Masaakira: *See*—
Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.
Unimation, Inc.: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,163,183, Cl. 318-568.000.
Union Carbide Corporation: *See*—
Beckman, John H., 4,162,693, Cl. 138-118.100.
Knopf, Robert J.; and Koleske, Joseph V., 4,163,113, Cl. 560-185.000.
Koleske, Joseph V.; and Knopf, Robert J., 4,163,114, Cl. 560-186.000.
Pepe, Enrico J.; and Marsden, James G., 4,163,073, Cl. 427-221.000.
Rasmussen, Jerome J. M., 4,162,557, Cl. 17-45.000.
Smith, Oliver W.; and Koleske, Joseph V., 4,163,029, Cl. 525-449.000.
Weatherly, Merle H.; and Tucker, Robert C., Jr., 4,163,071, Cl. 427-34.000.
Union Oil Company of California: *See*—
Dhondt, Roland O., 4,162,960, Cl. 208-11.00R.
Woertz, Byron B., 4,163,044, Cl. 423-234.000.
Uniroyal, Inc.: *See*—
Kaiser, Louis; and Pascal, Charles J., 4,162,729, Cl. 206-592.000.
Unit Rig & Equipment Co.: *See*—
Satterwhite, Charles L., 4,162,584, Cl. 37-190.000.
United States of America
Air Force: *See*—
Gilbert, William W., III; and Gomez, Eduardo W., 4,162,777, Cl. 244-123.000.
Martin, Jacob H., 4,162,818, Cl. 339-112.00R.
Army: *See*—
Esaki, Leo; and Tsu, Raphael, 4,163,238, Cl. 357-17.000.
Lux, Virginia J.; and Tsaknis, Peter J., 4,162,875, Cl. 366-273.000.
Energy: *See*—
Asmanes, Charles, 4,162,593, Cl. 51-218.00R.
Gorin, Everett, 4,162,963, Cl. 208-108.000.
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.
Health, Education and Welfare: *See*—
Ito, Yoichiro, 4,162,761, Cl. 233-24.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Shepard, Neal F., Jr. Solar cell module. 4,162,928, Cl. 136-89.0PC.
National Aeronautics and Space Administration: *See*—
Ollendorf, Stanford, 4,162,701, Cl. 165-32.000.
Navy: *See*—
Beno, Lawrence A.; Harrell, John T.; Evans, Albert B., Jr.; and Gaudig, Jay R., 4,163,234, Cl. 343-17.700.
Kaloi, Cyril M., 4,163,236, Cl. 343-700.0MS.
Reins, Edward R.; and Curry, Charles D. B., 4,163,286, Cl. 364-719.000.
Steen, Donald B., 4,163,135, Cl. 200-158.000.
U.S. Philips Corporation: *See*—
Aldenhoven, Ghislanus M. A. M., 4,162,756, Cl. 226-43.000.
Brandenburg, Klaus, 4,162,858, Cl. 400-124.000.
Hartog, Jan; and Zwagemakers, Johannes M. A., 4,163,060, Cl. 424-278.000.
Hasker, Jan, 4,163,169, Cl. 313-203.000.
Tillemans, Jacobus H., 4,162,561, Cl. 24-129.00R.
Van Gils, Wilhelmus M. J., 4,163,170, Cl. 313-217.000.
van Herk, Alfred; and Pulle, Duco W. J., 4,163,265, Cl. 360-77.000.
United States Steel Corporation: *See*—
Belcher, John A., 4,162,944, Cl. 201-41.000.
University of Iowa Research Foundation: *See*—
Cannon, Joseph G.; and Long, John P., 4,163,063, Cl. 424-330.000.
University of Utah: *See*—
Johnson, Steven A., 4,162,630, Cl. 73-194.00A.
Upaya, Inc.: *See*—
Budrose, Charles R., 4,163,134, Cl. 200-157.000.
Upjohn Company, The: *See*—
Bundy, Gordon L.; and Nelson, Norman A., 4,163,110, Cl. 560-121.000.
Yankee, Ernest W., 4,163,107, Cl. 560-61.000.
Upmeier, Hartmut: *See*—
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, 4,162,602, Cl. 53-415.000.
Uzumcu, Ali I.; Thorsen, Elmer J., Jr.; and Demkowicz, Robert M., to Duo-Fast Corporation. Fastener assembly. 4,162,728, Cl. 206-345.000.
Vac-Tec Systems, Inc.: *See*—
Morrison, Charles F., Jr., 4,162,954, Cl. 204-298.000.
Van den Bossche, Henri A., to National Distillers and Chemical Corporation. Catalyst spray nozzle. 4,163,040, Cl. 422-131.000.
Van der Beck, Roland R.; and Chapman, James W., to Sybron Corporation. Sight glass assembly and method for its production. 4,162,826, Cl. 350-319.000.
Van der Meer, Arie; and Lepomaa, Lauri A., to Kemira OY. Process for producing hydrogen fluoride from an aqueous solution of hydrogen fluoride and sulfuric acid. 4,163,045, Cl. 423-483.000.
van Ditshuizen, Henri; Schumann, Fritz; Goldammer, Georg; and Glaser, Richard, to Schubert & Salzer. Process and apparatus for removal of trash deposits on open-end spinning machine. 4,162,556, Cl. 15-312.00R.
van Dorp, David A.: *See*—
Beerthuis, Roelof K.; van Dorp, David A.; and Nugteren, Diederik H., 4,163,108, Cl. 560-121.000.
Van Gils, Wilhelmus M. J., to U.S. Philips Corporation. Low-pressure gas discharge lamp. 4,163,170, Cl. 313-217.000.
van Herk, Alfred; and Pulle, Duco W. J., to U.S. Philips Corporation. Magnetic disc memory and magnetic disc for this memory. 4,163,265, Cl. 360-77.000.
Van Mastrigt, Max, to W. C. Dillon and Co. Inc. Tension indicating device. 4,163,126, Cl. 200-61.130.
Van Steenhoven, Frank; and Hirt, Thomas D., to Miller Company, The. Outlet box mounting device. 4,162,779, Cl. 248-343.000.
Velsicol Chemical Corporation: *See*—
Albright, James A., 4,163,005, Cl. 260-45.70S.
Stach, Leonard J., 4,163,112, Cl. 560-132.000.
Veltman, Preston L.; and Blouin, John J., to W. R. Grace & Co. Method of drying complex sugar solutions. 4,162,926, Cl. 127-62.000.
Verbatim Corporation: *See*—
Bowers, George W., 4,162,774, Cl. 242-192.000.
Vereinigte Oesterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft: *See*—
Ransmayr, Wilhelm; and Mally, Heinz, 4,163,036, Cl. 264-12.000.

Verge, John P.: *See*—
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,163,048, Cl. 424-45.000.
Vetter, Arthur, to Multivac Sepp Haggenmuller KG. Apparatus for shaping plastics foils. 4,162,884, Cl. 425-388.000.
Vinot, Daniel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Associative memory. 4,163,288, Cl. 364-900.000.
Vlasov, Vadim V.: *See*—
Shumakov, Valery I.; Lokshin, Moisei A.; Vlasov, Vadim V.; Burynin, Vitaly A.; and Novikov, Nikolai V., 4,162,543, Cl. 3-1.700.
Vock, Manfred H.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,163,068, Cl. 426-538.000.
Vogt, Kuno J. Easy opening top closure member for a container. 4,162,742, Cl. 220-269.000.
Voles, Roger, to E M I Limited. Tracking and/or guidance systems. 4,162,775, Cl. 244-3.170.
Vollkommer, Norbert: *See*—
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
Vorontsov, Alexandr I.: *See*—
Gurevich, Elrikh I.; Filippov, Iosif F.; Prigorovsky, Igor A.; Khutoretsky, Garri M.; and Vorontsov, Alexandr I., 4,163,163, Cl. 310-59.000.
Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki: *See*—
Fedotov, Vladimir M.; Smirnov, Boris A.; Revo, Valery V.; and Lapchenko, Sergei N., 4,162,678, Cl. 128-305.000.
W. C. Dilion and Co. Inc.: *See*—
Van Mastrigt, Max, 4,163,126, Cl. 200-61.130.
W. R. Grace & Co.: *See*—
Veltman, Preston L.; and Blouin, John J., 4,162,926, Cl. 127-62.000.
W. Schlafhorst & Co.: *See*—
Kupper, Willi, 4,162,723, Cl. 198-469.000.
Wachi, Yasuyuki: *See*—
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.
Wada, Akiyoshi. Simultaneous photometering method and assembly for multi-dimensional measurements concerning biologically related materials. 4,162,851, Cl. 356-73.000.
Waddill, Harold G.: *See*—
Yeakey, Ernest L.; and Waddill, Harold G., 4,162,931, Cl. 156-331.000.
Wahlefeld, August W.; Looser, Siegfried; and Sturmann, Klaus A., to Boehringer Mannheim GmbH. Device for the chemical and/or physical treatment of liquids. 4,162,979, Cl. 210-282.000.
Waldes Kohinoor, Inc.: *See*—
Coch, Lester, 4,162,680, Cl. 118-76.000.
Walker, Duane H.; and Quarderer, Darrell W., to National Presto Industries, Inc. Pressure cooker. 4,162,741, Cl. 220-203.000.
Walker, Winston G., to Addmaster Corporation. MOSFET circuitry with automatic voltage control. 4,163,161, Cl. 307-297.000.
Wallace A. Erickson & Company: *See*—
Erickson, Wallace A.; and Suh, Byoung I., 4,163,004, Cl. 260-42.140.
Wallin, Jan-Olof, to Irvin Industries, Inc. Device for use in emergency locking mechanism for webbing-type seat belts. 4,162,773, Cl. 242-107.40A.
Walsh, Robert M., to Hercules Incorporated. Heat-fusible pastes for printing inks, adhesives and moldings. 4,162,997, Cl. 260-27.00R.
Walz, Stefan: *See*—
Jacob, Karl; Edmaier, Franz; Schulmeister, Robert; and Walz, Stefan, 4,162,668, Cl. 123-179.00F.
Walzel, Peter: *See*—
Schmidt, Paul; and Walzel, Peter, 4,162,617, Cl. 62-123.000.
Ward, Derrick A.: *See*—
Warner, Arthur R.; and Ward, Derrick A., 4,163,177, Cl. 315-208.000.
Ward, James W.: *See*—
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.
Warner, Arthur R.; and Ward, Derrick A. Oscillation generator providing oscillations of varying amplitude. 4,163,177, Cl. 315-208.000.
Warren, Kenneth S., to Case Western Reserve University. Field test for Schistosoma eggs. 4,162,850, Cl. 356-38.000.
Watanabe, Kenkichi; and Sentoku, Hideshi, to Laurel Bank Machine Co., Ltd. Apparatus for removing irregular stack of coins. 4,162,598, Cl. 53-54.000.
Watanabe, Seiji: *See*—
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Wachi, Yasuyuki, 4,163,166, Cl. 310-215.000.
Watanabe, Yosiaki: *See*—
Ishihara, Taketoshi; and Watanabe, Yosiaki, 4,162,852, Cl. 356-125.000.
Waterhouse, John S.: *See*—
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.
Wean United, Inc.: *See*—
Decima, Elmer E.; and Briggs, Albert T., 4,162,626, Cl. 72-238.000.
Weatherholt, Dallas D.: *See*—
Stapleton, Patrick; Browne, Hubbard P.; and Weatherholt, Dallas D., 4,162,868, Cl. 414-9.000.
Weatherly, Merle H.; and Tucker, Robert C., Jr., to Union Carbide Corporation. Method for forming hard wear-resistant coatings. 4,163,071, Cl. 427-34.000.
Webasto-Werke W. Baier GmbH & Co.: *See*—
Hirschberger, August, 4,162,805, Cl. 296-137.00G.
Webb, William M., to General Electric Company. Method and coupling for severing and rejoining sealed tubing. 4,162,566, Cl. 29-157.00R.
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., to Wesbar Corporation. Converter means for vehicle light. 4,163,275, Cl. 362-80.000.
Weckessar Company, Inc.: *See*—
Thomsen, Jack W., 4,162,560, Cl. 24-73.00P.
Weed Eater, Inc.: *See*—
Ballas, George C., 4,162,575, Cl. 30-347.000.
Weichel, Ernst. Mower for mounting on the front end of an agricultural vehicle. 4,162,606, Cl. 56-15.900.
Weishaupt, Siegfried; and Kopp, Hermann. Burner for liquid fuels. 4,162,888, Cl. 431-265.000.
Weldy, Winfred E.: *See*—
Paul, James T., Jr.; and Weldy, Winfred E., 4,163,003, Cl. 260-40.00R.
Wemheuer, Helmut: *See*—
Schade, Gerhard; Vollkommer, Norbert; and Wemheuer, Helmut, 4,163,101, Cl. 528-347.000.
Wesbar Corporation: *See*—
Weber, Bernard R.; Hanson, Brian A.; and Cunningham, Alton J., 4,163,275, Cl. 362-80.000.
Wesemeyer, Jurgen; and Haubner, Georg, to Robert Bosch GmbH. Remote load control system. 4,163,217, Cl. 340-167.00R.
West, Robert L., to Ameron, Inc. Rod tensioner. 4,162,771, Cl. 242-7.220.
Westall, Thomas E.; and Miller, Frank, to American Thread Company, The. Apparatus and method for folding and banding skeins of yarn. 4,162,600, Cl. 53-120.000.
Western Geophysical Co. of America: *See*—
Hall, Ernest M., Jr., 4,163,206, Cl. 340-17.00R.
Westinghouse Electric Corp.: *See*—
Bould, Fred, 4,163,133, Cl. 200-153.0SC.
Husson, Alan L.; and Kurland, Marvin, 4,162,719, Cl. 187-29.00R.
Perkins, John F., 4,163,131, Cl. 200-148.00A.
Westvaco Corporation: *See*—
Dowd, Daniel J., 4,163,180, Cl. 318-6.000.
Wheeler, Robert V.; and Oswald, Richard A., to Technical Operations, Incorporated. Neutron personnel dosimeter. 4,163,154, Cl. 250-473.000.
White Consolidated Industries, Inc.: *See*—
Malarkey, Terence D.; and Moreland, William C., II, 4,163,139, Cl. 219-10.49R.
White, Stanley A., to Rockwell International Corporation. Spatial toner for image reconstitution. 4,163,257, Cl. 358-133.000.
Wickens, Alan H., to British Railways Board. Railway vehicle bogies resiliently interconnected axle boxes. 4,162,653, Cl. 105-166.000.
Wieschen, Hermann: *See*—
Dorr, Karl-Heinz; Daradimos, Georg; Grimm, Hugo; Schmidt, Georg; Gerken, Rudolf; Mucke, Christoph; and Wieschen, Hermann, 4,163,047, Cl. 423-531.000.
Wiesner, Paul; and Stonner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Removing phenols from waste water. 4,162,902, Cl. 55-54.000.
Wigger, August: *See*—
Richter, Peter; Wigger, August; Fahrbach, Gerhard; Seiler, Erhard; and Barzynski, Helmut, 4,162,919, Cl. 96-87.00R.
Wiggins Teape Limited: *See*—
Thornton, John N., 4,162,649, Cl. 93-93.00D.
Wilczek, Stephen P.: *See*—
Traister, Robert L.; and Wilczek, Stephen P., 4,162,844, Cl. 355-14.000.
Wiley, Ralph M.; Meeks, Merritt R.; and Beebe, Burke A., to Dow Chemical Company, The. Process for preparing normally crystalline vinylidene halide polymers having superior flow properties employing a combination of colloidal silica and non-ionic water soluble cellulose ether having a viscosity of about 5 cp or less as stabilizing agents. 4,163,090, Cl. 526-88.000.
Wilkins, Ronald D., to ACF Industries, Incorporated. Seal assembly for butterfly valve. 4,162,782, Cl. 251-173.000.
Willetts, Elwood H. Truck suspension system. 4,162,799, Cl. 280-683.000.
Wm. E. Wright Co.: *See*—
Wright, William R.; Murphy, Theodore; Piazzo, Kenneth; and Leal, August, 4,162,892, Cl. 8-4.000.
Wm. R. Stewart & Sons (Hacklemakers) Limited: *See*—
Stewart, David B., 4,162,559, Cl. 19-113.000.
Williams, B. E.: *See*—
Williams, Beverly E., 4,163,070, Cl. 426-642.000.
Williams, Beverly E., to Williams, B. E.; and Williams, K. I. Shrouding skinned meat carcasses. 4,163,070, Cl. 426-642.000.
Williams, Frederic D. M.: *See*—
Charles, Paul A. S.; and Williams, Frederic D. M., 4,162,549, Cl. 4-318.000.
Williams, K. I.: *See*—
Williams, Beverly E., 4,163,070, Cl. 426-642.000.
Williamson, William R. N.: *See*—
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,163,048, Cl. 424-45.000.
Willingham, Millard L., to Gipson, Carl R. Hammock. 4,162,550, Cl. 5-123.000.

Wilson-Miner R & D: *See*—
Hudson, William W.; and Wilson, Woodrow W., 4,162,726, Cl. 198-678.000.
Wilson, Woodrow L., 4,162,709, Cl. 172-20.000.
Wilson, Woodrow L., to Wilson-Miner R & D. Sod harvesting severing means for forming and orienting individual sod pads. 4,162,709, Cl. 172-20.000.
Wilson, Woodrow W.: *See*—
Hudson, William W.; and Wilson, Woodrow W., 4,162,726, Cl. 198-678.000.
Windmoller & Holscher: *See*—
Achelpohl, Fritz; Feldkamper, Richard; Langemeyer, Carl; Tetenborg, Konrad; and Upmeier, Hartmut, 4,162,602, Cl. 53-415.000.
Wingler, Frank: *See*—
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,163,032, Cl. 525-74.000.
Winter, Heinrich J., to Heinrich Josef Winter Kunststoffverarbeitung unde Werkzeugbau GmbH. Cleaning device for circular discs. 4,162,552, Cl. 15-104.920.
Wise, Kenneth V., to Monsanto Company. Oxidation and ammoxidation catalysts. 4,162,992, Cl. 252-456.000.
Wiseman, Raymond L. Article stacking apparatus. 4,162,733, Cl. 414-78.000.
Woertz, Byron B., to Union Oil Company of California. Method for removing hydrogen sulfide from steam. 4,163,044, Cl. 423-234.000.
Wohrl, Alfons: *See*—
Spies, Johann; and Wohrl, Alfons, 4,163,268, Cl. 361-1.000.
Wolfrum, Gerhard: *See*—
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,163,013, Cl. 260-206.000.
Wood, Charles L.: *See*—
Lining, Kurt; and Wood, Charles L., 4,162,910, Cl. 65-163.000.
Wood, James E.: *See*—
Bayless, John R.; Seliger, Robert L.; Ward, James W.; and Wood, James E., 4,163,151, Cl. 250-296.000.
Woodall, Harold C.: *See*—
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.
Wright, Ralph R.: *See*—
Mashburn, Douglas N.; Woodall, Harold C.; and Wright, Ralph R., 4,162,813, Cl. 308-237.00R.
Wright, William R.; Murphy, Theodore; Piazzo, Kenneth; and Leal, August, to Wm. E. Wright Co. Method of manufacturing continuous coil slide fasteners. 4,162,892, Cl. 8-4.000.
Wright, William V., to Metrolina Design Group. Stacking plastic bottle case. 4,162,738, Cl. 220-21.000.
Wu, Alexander C., to Burroughs Corporation. Method and apparatus for developing a latent, electrostatic image in non-impact printing. 4,162,842, Cl. 355-3.0DD.
Wu, William I. L. Electronic multiple device control system. 4,163,218, Cl. 340-310.00A.
Wurster, Ewald, to Patent-Treuhand Gesellschaft fur Electrische Glumlampen mbH. Halogen cycle incandescent lamp. 4,163,171, Cl. 313-221.000.
Wyant, Melvin F. Live animal trap. 4,162,588, Cl. 43-61.000.
Wyle, Frank S.: *See*—
Greer, Edward M.; Wyle, Frank S.; and Packer, Martin R., 4,162,692, Cl. 138-30.000.
Wysong, Don V., to Dow Chemical Company, The. Aryloxymethyl imidazolines. 4,163,105, Cl. 548-342.000.
Xerox Corporation: *See*—
Smith, Wayne R.; and Miller, William G., 4,162,845, Cl. 355-14.000.
Traister, Robert L.; and Wilczek, Stephen P., 4,162,844, Cl. 355-14.000.
Yagii, Kiyoshi; and Oshio, Hideki, to Central Glass Company, Limited. Method of dehalogenating halogenated hydrocarbon to yield elemental halogen. 4,162,948, Cl. 204-80.000.
Yamada, Takashi; Shirasaki, Shinji; Sakakibara, Yukio; and Fukaya, Hiroyasu, to Nippondenso Co., Ltd. Electrical control method and apparatus for combustion engines. 4,163,282, Cl. 364-431.000.
Yamaguchi, Masanaga: *See*—
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,163,038, Cl. 422-36.000.
Yamaguchi, Shunzo: *See*—
Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; Morino, Seiji; and Umeda, Naoki, 4,162,669, Cl. 123-210.000.
Yamaguchi, Testuo: *See*—
Tunematu, Toyoaki; Takeno, Seiichi; and Yamaguchi, Testuo, 4,163,202, Cl. 334-76.000.
Yamamoto, Yoshihiro: *See*—
Hongu, Masayuki; Tokuhara, Masaharu; Yamamoto, Yoshihiro; and Kawakami, Hiromi, 4,163,196, Cl. 329-50.000.
Yamanobe, Kouji: *See*—
Inoue, Satoru; Umehara, Masaakira; Aramaki, Kazuo; Inuzuka, Hideo; and Yamanobe, Kouji, 4,162,843, Cl. 355-4.000.
Yan, Tsoung-yuan, to Mobil Oil Corporation. Method of treating formation to remove ammonium ions. 4,162,707, Cl. 166-252.000.
Yang, Neng-Tze: *See*—
Ragonese, Louis J.; and Yang, Neng-Tze, 4,163,244, Cl. 357-44.000.
Yankee, Ernest W., to Upjohn Company, The. ω-Aryl-cis-13-PGF compounds. 4,163,107, Cl. 560-61.000.
Yasuda, Katsuya; and Adachi, Akio, to Hochiki Corporation. Display device with memory. 4,163,224, Cl. 340-520.000.
Yasuda, Takeru: *See*—
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,162,612, Cl. 60-276.000.
Yazaki, Seiichi, to Fujimoto Company, Limited. Magneto-therapeutic device. 4,162,672, Cl. 128-1.300.
Yeakey, Ernest L.; and Waddill, Harold G., to Texaco Development Corp. Method employing polyamide thermoplastic adhesives. 4,162,931, Cl. 156-331.000.
Yorio, Albert E.: *See*—
Yorio, Noelle; and Yorio, Albert E., 4,162,623, Cl. 70-364.00A.
Yorio, Noelle; and Yorio, Albert E. Key and lock system. 4,162,623, Cl. 70-364.00A.
Yoshikawa, Noriaki; Komagata, Hitoshi; and Sato, Yoshio, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Radio channel control system for mobile radio telephone systems. 4,163,121, Cl. 179-2.0EB.
Yoshikumi, Chikao; Furusho, Takao; Matsunaga, Kenichi; and Toyoda, Noriyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the cultivation of Basidiomycetes belonging to the genus Coriolus of Polyporaceae. 4,162,939, Cl. 435-254.000.
Yoshimura, Noboru, to Aisin Seiki Kabushiki Kaisha. Lumbar support regulating apparatus. 4,162,807, Cl. 297-284.000.
Youngstown Steel Door Company, The: *See*—
Madland, Thorvald; and Soddy, Thomas C., 4,162,591, Cl. 49-277.000.
Yugenkaisha Shinjo Seikakusho: *See*—
Shinjo, Katsumi, 4,162,724, Cl. 198-534.000.
Zappala, Giuseppe: *See*—
Farina, Attilio; and Zappala, Giuseppe, 4,163,179, Cl. 315-408.000.
Zdrodowski, Joseph J., to Hoffmann-La Roche Inc. Time division flow control. 4,162,689, Cl. 137-266.000.
Zelt, Edward J.; Dippold, William L.; Gerg, Robert L.; and Klaiber, Raymond W., Jr., to Stackpole Carbon Company. Electric motor brush holder. 4,163,167, Cl. 310-242.000.
Zenith Radio Corporation: *See*—
Skerlos, Peter C., 4,163,259, Cl. 358-191.000.
Zinner, Peter. Removable antiskid device on a vehicle wheel, in particular, an automobile wheel. 4,162,697, Cl. 152-217.000.
Zlokarnik, Marko, to Bayer Aktiengesellschaft. Injectors and their use in gassing liquids. 4,162,970, Cl. 210-15.000.
Zlokarnik, Marko; and Elgeti, Klaus, to Bayer Aktiengesellschaft. Injectors with deflectors for their use in gassing liquids. 4,162,971, Cl. 210-15.000.
Zondler, Helmut; and Schneider, Wolfgang, to Ciba-Geigy Corporation. Coating compound based on epoxide resin, an amine curing agent, and a hydrazone modifier. 4,163,098, Cl. 528-99.000.
Zuerndorfer, Henry D.; Maurer, Hans A.; and Banks, Donald S., to Raytheon Company. Radar mapping technique. 4,163,231, Cl. 343-5.0CM.
Zwagemakers, Johannes M. A.: *See*—
Hartog, Jan; and Zwagemakers, Johannes M. A., 4,163,060, Cl. 424-278.000.
Zweifel, Hans: *See*—
Baumann, Niklaus; Zweifel, Hans; Bauman, Marcus; and Waterhouse, John S., 4,163,097, Cl. 525-531.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bethlehem Steel Corporation: *See*—
Kreiger, John W., Re. 30,060, Cl. 75-3.000.

Colgate-Palmolive Company: *See*—
Schaar, Charles H., Re. 30,057, Cl. 128-287.000.

Halls, Lawrence M., to Sperry Rand Corporation. Crop harvesting machine header suspension system. Re. 30,056, Cl. 56-208.000.

Johnson & Johnson: *See*—
Shepherd, Robert C., Re. 30,061, Cl. 156-78.000.

Katahira, Yukio, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Shuttle speed control device. Re. 30,058, Cl. 352-14.000.

Kreiger, John W., to Bethlehem Steel Corporation. Method for agglomerating wet-collected fume for use in metallurgical furnaces and agglomerates produced thereby. Re. 30,060, Cl. 75-3.000.

Lindstrom, Jon M., to Salk Institute for Biological Studies, The. Assay for myasthenia gravis. Re. 30,059, Cl. 23-230.300.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See*—
Katahira, Yukio, Re. 30,058, Cl. 352-14.000.

Salk Institute for Biological Studies, The: *See*—
Lindstrom, Jon M., Re. 30,059, Cl. 23-230.300.

Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper. Re. 30,057, Cl. 128-287.000.

Shepherd, Robert C., to Johnson & Johnson. Nonwoven fibrous product and method of making the same. Re. 30,061, Cl. 156-78.000.

Sperry Rand Corporation: *See*—
Halls, Lawrence M., Re. 30,056, Cl. 56-208.000.

LIST OF PLANT PATENTEES

Handy, Glen E. Dogwood tree. 4,444, 7-31-79, Cl. 51.000.

LIST OF DESIGN PATENTEES

Alaniz, Alan A. Placard or the like. 252,503, 7-31-79, Cl. D11-134.000.

American Optical Corporation: *See*—
Canavan, Richard W., III, 252,517, Cl. D16-65.000.

American Seating Company: *See*—
Blodee, Leif, 252,482, Cl. D6-26.000.

Barradas, George, to SCM Corporation. Fry pan. 252,493, 7-31-79, Cl. D7-94.000.

Blodee, Leif, to American Seating Company. Theater chair. 252,482, 7-31-79, Cl. D6-26.000.

Breger, Carl-Arne, to Sandvik Aktiebolag. Cover for handle of a hammer. 252,495, 7-31-79, Cl. D8-80.000.

Budish, Bernard O., to Victory Games. Miniature golf game board. 252,530, 7-31-79, Cl. D21-27.000.

California R & D Center: *See*—
Jones, Lawrence T.; and Sims, Anson, 252,522, Cl. D21-177.000.

Canavan, Richard W., III, to American Optical Corporation. Spectacles. 252,517, 7-31-79, Cl. D16-65.000.

Centronics Data Computer Corp.: *See*—
Roche, David E., 252,519, Cl. D18-23.000.

Chieda, Robert A., to Clairol Incorporated. Tweezer. 252,529, 7-31-79, Cl. D28-55.000.

Clairol Incorporated: *See*—
Chieda, Robert A., 252,529, Cl. D28-55.000.

Clark, Charles J. Wear point for agricultural fertilizer shank. 252,506, 7-31-79, Cl. D15-29.000.

Courreges, Andre, to Piade. Bottle. 252,497, 7-31-79, Cl. D9-168.000.

Dake, Donald W. Fishing lure body. 252,523, 7-31-79, Cl. D22-28.000.

DeNyse, Robert G. Furnace. 252,526, 7-31-79, Cl. D23-97.000.

Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A. Snow sled. 252,505, 7-31-79, Cl. D12-9.000.

Double, Richard L. Cable strap saddle. 252,496, 7-31-79, Cl. D8-356.000.

Fairchild Camera and Instrument Corporation: *See*—
Shimasaki, Ken, 252,499, Cl. D10-15.000.

Fiat Motors of North America, Inc.: *See*—
Kozloski, Edward A., 252,509, Cl. D12-209.000.

Fima, Raoul G. Terminal for jump cables. 252,510, 7-31-79, Cl. D13-13.000.

Fujimoto, Munenori: *See*—
Kawano, Takeyoshi; and Fujimoto, Munenori, 252,514, Cl. D14-70.000.

Gehrig, Walter. Plaque or similar article. 252,504, 7-31-79, Cl. D11-136.000.

Genz, Marlin J. Microphone stand. 252,511, 7-31-79, Cl. D14-13.000.

Glassman, Fredrick R. Light fixture. 252,531, 7-31-79, Cl. D48-3.000.

Glassman, Fredrick R. Light fixture. 252,532, 7-31-79, Cl. D48-3.000.

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Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.

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Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.
Kuzmichev, Lev A.: *See*—
Derkach, Gennady G.; Kovtonjuk, Vladimir A.; Kuryabin, Valentin A.; Makhonov, Boris B.; and Kuzmichev, Lev A., 252,505, Cl. D12-9.000.
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Kawano, Takeyoshi; and Fujimoto, Munenori, 252,514, Cl. D14-70.000.
Makino, Katsuhiko; and Ohta, Kikuo, 252,513, Cl. D14-70.000.
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Nakahara, Masao: *See*—
Yamauchi, Mineo; and Nakahara, Masao, 252,501, Cl. D10-73.000.
Ohta, Kikuo: *See*—
Makino, Katsuhiko; and Ohta, Kikuo, 252,513, Cl. D14-70.000.
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Petersilie, Frank W., to Investments & Innovative Concepts, Inc. Seat or similar unit of furniture. 252,490, 7-31-79, Cl. D6-71.000.
Piade: *See*—
Courreges, Andre, 252,497, Cl. D9-168.000.
Plasti-Fab Co. Ltd.: *See*—
Hoffman, Paul R.; and Wallenwein, Hans K., 252,491, Cl. D6-130.000.
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Rudkin-Wiley Corporation: *See*—
Wiley, Nathaniel C., Jr., 252,508, Cl. D12-181.000.
Russo, Richard A. Stove. 252,525, 7-31-79, Cl. D23-97.000.
Sandvik Aktiebolag: *See*—
Breger, Carl-Arne, 252,495, Cl. D8-80.000.
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Barradas, George, 252,493, Cl. D7-94.000.
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Sims, Anson: *See*—
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Takahashi, Hanji: *See*—
Mori, Daisaku; Harada, Toshio; and Takahashi, Hanji, 252,494, Cl. D7-128.000.
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Thomsen Equipment Company: *See*—
McGraw, John T., 252,515, Cl. D15-7.000.
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Union Carbide Corporation: *See*—
Kelly, William T., III, 252,502, Cl. D10-77.000.
U.S. Philips Corporation: *See*—
Van Deuren, Andries, 252,512, Cl. D14-6.000.
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Budish, Bernard O., 252,530, Cl. D21-27.000.
Wallenwein, Hans K.: *See*—
Hoffman, Paul R.; and Wallenwein, Hans K., 252,491, Cl. D6-130.000.
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CLASS 2

15 4,162,542

CLASS 3

1.7 4,162,543

CLASS 4

185 H 4,162,544
190 4,162,545
191 4,162,546
259 4,162,547
300 4,162,548
318 4,162,549

CLASS 5

123 4,162,550

CLASS 8

4 4,162,892
10.1 4,162,893

CLASS 14

69.5 4,162,551

CLASS 15

104.92 4,162,552
167 R 4,162,553
184 4,162,554
250.01 4,162,555
312 R 4,162,556

CLASS 17

45 4,162,557
67 4,162,558

CLASS 19

113 4,162,559

CLASS 23

230 A 4,162,894
230 R 4,162,896
230.3 Re.30,059
232 C 4,162,897

CLASS 24

73 P 4,162,560
129 R 4,162,561

CLASS 28

151 4,162,562
163 4,162,563
248 4,162,564

CLASS 29

33 R 4,162,565
157 R 4,162,566
159 R 4,162,567
281.3 4,162,568
417 4,162,569
427 4,162,570
460 4,162,571
630 D 4,162,572
705 4,162,573

CLASS 30

29.5 4,162,574
347 4,162,575

CLASS 32

40 R 4,162,576

CLASS 33

27 L 4,162,577
265 4,162,579
443 4,162,578

CLASS 34

103 4,162,580

CLASS 35

8 R 4,162,581
12 N 4,162,582

CLASS 36

76 R 4,162,583

CLASS 37

190 4,162,584

CLASS 40

518 4,162,585

CLASS 42

71 P 4,162,586

CLASS 43

18 R 4,162,587
61 4,162,588

CLASS 44

1 R 4,162,898

CLASS 46

77 4,162,589

CLASS 49

55 4,162,590
277 4,162,591
358 4,162,592

CLASS 51

218 R 4,162,593
295 4,162,899
4,162,900

CLASS 52

9 4,162,594
69 4,162,595
295 4,162,596
410 4,162,597

CLASS 53

54 4,162,598
77 4,162,599
120 4,162,600
292 4,162,601
415 4,162,602
438 4,162,603
557 4,162,604

CLASS 55

17 4,162,901
54 4,162,902
73 4,162,903
276 4,162,904
337 4,162,905
346 4,162,906

CLASS 56

7 4,162,605
15.9 4,162,606
208 Re.30,056

CLASS 57

287 4,162,607

CLASS 58

23 R 4,162,608
38 R 4,162,609
148 4,162,610

CLASS 60

39.65 4,162,611
276 4,162,612
278 4,162,613
370 4,162,614
478 4,162,615
533 4,162,616

CLASS 62

123 4,162,617

CLASS 64

23 4,162,618
4,162,619

CLASS 65

29 4,162,907
60 D 4,162,908
163 4,162,909
4,162,910
229 4,162,911

CLASS 66

187 4,162,620

CLASS 68

23.2 4,162,621

CLASS 70

16 4,162,622
364 A 4,162,623

CLASS 71

79 4,162,912
92 4,162,913

CLASS 72

8 4,162,624
54 4,162,625
238 4,162,626
247 4,162,627

CLASS 73

141 A 4,162,628
141 R 4,162,629
194 A 4,162,630
362 AR 4,162,631
432 A 4,162,632
462 4,162,633
4,162,634
623 4,162,635
638 4,162,636

CLASS 74

711 4,162,637

CLASS 75

0.5 B 4,162,914
3 Re.30,060
14 4,162,915
21 4,162,916
130 R 4,162,917
171 4,162,918

CLASS 81

9.5 R 4,162,638
52.4 R 4,162,639
311 4,162,640

CLASS 83

71 4,162,641
328 4,162,642
499 4,162,643

CLASS 84

1.03 4,162,644

CLASS 86

23 4,162,645

CLASS 89

41 EA 4,162,646

CLASS 93

1 G 4,162,648
93 D 4,162,649

CLASS 96

87 R 4,162,919

CLASS 99

419 4,162,650

CLASS 101

287 4,162,651
425 4,162,652

CLASS 105

166 4,162,653

CLASS 106

14.5 4,162,920
39.8 4,162,921
100 4,162,922
104 4,162,923
120 4,162,924
208 4,162,925

CLASS 110

212 4,162,654
4,162,655
221 4,162,656

CLASS 112

101 4,162,657

CLASS 114

74 A 4,162,658

CLASS 116

234 4,162,659
268 4,162,660

CLASS 118

76 4,162,680

CLASS 119

3 4,162,681
16 4,162,682
51 R 4,162,683
73 4,162,684
103 4,162,685

CLASS 122

149 4,162,686

CLASS 123

30 C 4,162,661
65 VD 4,162,662
75 B 4,162,663
4,162,664
117 D 4,162,666
4,162,667
117 R 4,162,665
179 F 4,162,668
210 4,162,669

CLASS 126

19.5 4,162,670
400 4,162,671

CLASS 127

16 4,162,927
62 4,162,926

CLASS 128

1.3 4,162,672
55 4,162,675
214 D 4,162,676
287 Re.30,057
303.1 4,162,677
305 4,162,678
419 P 4,162,679
680 4,162,674
748 4,162,673

CLASS 132

91 4,162,687
92 A 4,162,688

CLASS 136

89 PC 4,162,928
233 4,162,929

CLASS 137

266 4,162,689
385 4,162,690
613 4,162,691

CLASS 138

30 4,162,692
118.1 4,162,693

CLASS 141

1 4,162,694

CLASS 148

38 4,162,930

CLASS 150

35 4,162,695
52 J 4,162,696

CLASS 152

217 4,162,697
354 RB 4,162,698

CLASS 156

78 Re.30,061
331 4,162,931
630 4,162,932

CLASS 162

17 4,162,933
155 4,162,934
220 4,162,935
276 4,162,936
352 4,162,937

CLASS 164

4 4,162,699
154 4,162,700

CLASS 165

32 4,162,701
142 4,162,702
167 4,162,703

CLASS 166

77.5 4,162,704
186 4,162,705
251 4,162,706
252 4,162,707

CLASS 172

4.5 4,162,708
20 4,162,709

CLASS 174

74 A 4,163,117
99 B 4,163,118

CLASS 177

141 4,162,710

CLASS 179

1 F 4,163,119
1 SM 4,163,120
2 EB 4,163,121
15 AL 4,163,123
15 AT 4,163,122
18 D 4,163,124

CLASS 180

13 4,162,711
53 R 4,162,714
242 4,162,713
253 4,162,712
287 4,162,716

CLASS 182

48 4,162,717

CLASS 187

29 A 4,162,718
29 R 4,162,719

CLASS 188

71.9 4,162,720
73.3 4,162,721

CLASS 198

418 4,162,722
469 4,162,723
534 4,162,724
628 4,162,725
678 4,162,726
688 4,162,727

CLASS 200

5 A 4,163,125
61.13 4,163,126
61.47 4,163,127
61.58 B 4,163,128
81.4 4,163,129
144 B 4,163,130
148 A 4,163,131
153 M 4,163,132
153 SC 4,163,133
157 4,163,134
158 4,163,135
296 4,163,136
302 4,163,137
310 4,163,138

CLASS 201

12 4,162,943
41 4,162,944

CLASS 202

173 4,162,945

CLASS 203

72 4,162,946

CLASS 204

55 R 4,162,947
80 4,162,948
140 4,162,949
149 4,162,950
213 4,162,951
224 R 4,162,952
252 4,162,953
298 4,162,954
299 EC 4,162,955

CLASS 206

345 4,162,728
592 4,162,729

CLASS 208

8 LE 4,162,956
4,162,958
8 R 4,162,957
4,162,959
11 R 4,162,960
57 4,162,961
58 4,162,962
108 4,162,963
177 4,162,964
4,162,965

CLASS 209

166 4,162,966
235 4,162,967
400 4,162,968
447 4,162,969

CLASS 210

15 4,162,970
4,162,971
44 4,162,972
73 W 4,162,973
120 4,162,974
124 4,162,975
170 4,162,976
198 C 4,162,977
213 4,162,978
282 4,162,979
360 R 4,162,980
375 4,162,981
486 4,162,982

CLASS 211

118 4,162,730
126 4,162,731

CLASS 215

256 4,162,736

CLASS 219

10.49 R 4,163,139
10.55 B 4,163,140
10.55 F 4,163,141
79 4,163,142
225 4,163,143
368 4,163,144
523 4,163,145
542 4,163,146

CLASS 220

1.5 4,162,737
21 4,162,738
85 P 4,162,740
203 4,162,741
269 4,162,742
270 4,162,743

CLASS 221

70 4,162,739
251 4,162,744

CLASS 222

148 4,162,745
153 4,162,746
185 4,162,747
250 4,162,750
293 4,162,751
342 4,162,752
632 4,162,748
633 4,162,749

CLASS 223

85 4,162,753

CLASS 224

165 4,162,754
326 4,162,755

CLASS 226

43 4,162,756

CLASS 228

1 R 4,162,757
131 4,162,758

CLASS 229

2.5 R 4,162,759

CLASS 233

19 R 4,162,760
24 4,162,761

CLASS 235

312 4,163,147
461 4,162,762

CLASS 239

101 4,162,763
152 4,162,764
337 4,162,765
656 4,162,766

CLASS 241

30 4,162,767
45 4,162,768
68 4,162,769
191 4,162,770

CLASS 242

7.22 4,162,771
107 4,162,772
107.4 A 4,162,773
192 4,162,774

CLASS 244

3.17 4,162,775
118 R 4,162,776
123 4,162,777

CLASS 248

343 4,162,779
610 4,162,778

CLASS 249

127 4,162,780
144 4,162,781

CLASS 250

201 4,163,148
204 4,163,149
205 4,163,150
296 4,163,151
374 4,163,152
423 R 4,163,153
473 4,163,154
492 B 4,163,155
4,163,156
561 4,163,157
4,163,158

CLASS 251

173 4,162,782

CLASS 252

8.6 4,162,983
8.8 4,162,984
32.7 E 4,162,985
33.2 4,162,986
135 4,162,987
299 4,162,988
312 4,162,989
383 4,162,990
413 4,162,991
456 4,162,992
477 R 4,162,993
532 4,162,994

CLASS 256

10 4,162,783

CLASS 260

2.3 4,162,995
4 R 4,162,996
27 R 4,162,997
28 R 4,162,998
28.5 B 4,162,999
29.6 MN 4,163,001
29.6 S 4,163,000
40 R 4,163,002
4,163,003
42.14 4,163,004
45.7 S 4,163,005
45.75 R 4,163,007
45.8 NT 4,163,006
45.85 B 4,163,008
112 R 4,163,009
4,163,010
112.5 R 4,163,011
182 4,163,012
206 4,163,013
326 C 4,163,014
326.25 4,163,015
345.8 P 4,163,016
397.1 4,163,017
429.9 4,163,018
453 P 4,163,019
454 4,163,020
456 P 4,163,021
553 R 4,163,022
556 A 4,163,023
566 R 4,163,024
570.9 4,163,025
583 P 4,163,026
586 P 4,163,027
931 4,163,034

CLASS 261

77 4,163,035

CLASS 264

12 4,163,036
54 4,163,037

CLASS 266

176 4,162,784

CLASS 269

41 4,162,785

CLASS 271

64 4,162,786
173 4,162,787

CLASS 272

71 4,162,788

CLASS 273

25 4,162,789
58 C 4,162,790
73 D 4,162,791
85 G 4,162,792
121 A 4,162,793
174 4,162,794

CLASS 277

237 R 4,162,795

CLASS 280

5 R 4,162,796
275 4,162,797
475 4,162,798
683 4,162,799
801 4,162,715

CLASS 281

42 4,162,800

CLASS 285

45 4,162,801
343 4,162,802

CLASS 294

83 R 4,162,803
101 4,162,804

CLASS 296

137 G 4,162,805

CLASS 297

19 4,162,806
284 4,162,807

CLASS 299

2 4,162,808
37 4,162,809
43 4,162,810

CLASS 307

255 4,163,159
260 4,163,160
297 4,163,161
400 4,163,162

CLASS 308

172 4,162,812
237 R 4,162,813

CLASS 310

59 4,163,163
103 4,163,164
154 4,163,165
215 4,163,166
242 4,163,167
328 4,163,168

CLASS 312

223 4,162,814

CLASS 313

203 4,163,169
217 4,163,170
221 4,163,171
302 4,163,172
352 4,163,173

CLASS 315

10 4,163,174
39.51 4,163,175
53 4,163,176
208 4,163,177
241 P 4,163,178
408 4,163,179

CLASS 318

6 4,163,180
245 4,163,181
331 4,163,182
568 4,163,183
573 4,163,184
601 4,163,185

CLASS 320

48 4,163,186

CLASS 322

29 4,163,187

CLASS 323

4 4,163,188
6 4,163,189
4,163,190
89 M 4,163,191

CLASS 324

15 4,163,192
29.5 4,163,193
4,163,194

CLASS 325

313 4,163,195

CLASS 329

50 4,163,196

CLASS 330

263 4,163,197
277 4,163,198

CLASS 331

94.5 C 4,163,200
94.5 G 4,163,199

CLASS 333

194 4,163,201

CLASS 334

76 4,163,202
86 4,163,203

CLASS 338

114 4,163,204

CLASS 339

19 4,162,815
64 M 4,162,816
75 MP 4,162,817
112 R 4,162,818
247 4,162,819

CLASS 340

7 R 4,163,205
17 R 4,163,206
58 4,163,207
4,163,208
146.1 E 4,163,209
4,163,210
146.2 4,163,211
146.3 AC 4,163,214
146.3 D 4,163,213
146.3 H 4,163,212
149 A 4,163,215
152 R 4,163,216
167 R 4,163,217
310 A 4,163,218
310 R 4,163,219
331 4,163,220
347 AD 4,163,221
365 S 4,163,222
384 R 4,163,223
520 4,163,224
569 4,163,225
629 4,163,226
662 4,163,227
711 4,163,228
745 4,163,229
765 4,163,230

CLASS 343

5 CM 4,163,231
6.8 R 4,163,232
12 R 4,163,233
17.7 4,163,234
100 SA 4,163,235
700 MS 4,163,236

CLASS 350

36 4,162,820
96.21 4,162,821
187 4,162,822
252 4,162,823
293 4,162,824
295 4,162,825
319 4,162,826

CLASS 351

7 4,162,827
9 4,162,828

CLASS 352

14 Re.30,058
166 4,162,829

CLASS 354

10 4,162,846
23 D 4,162,839
23 R 4,162,830
31 4,162,831
51 4,162,832
86 4,162,833
4,162,834
106 4,162,835
139 4,162,836
173 4,162,837
223 4,162,838
246 4,162,840
310 4,162,841

CLASS 355

3 DD 4,162,842
4 4,162,843
14 4,162,844
4,162,845
4,162,847
4,162,848

CLASS 356

36 4,162,849
38 4,162,850
73 4,162,851
125 4,162,852
225 4,162,853

CLASS 357

16 4,163,237
17 4,163,238
24 4,163,239
29 4,163,240
38 4,163,241
41 4,163,242
4,163,243
44 4,163,244
51 4,163,245
68 4,163,246

CLASS 358

12 4,163,247
4,163,248
21 R 4,163,249
45 4,163,250
107 4,163,251
118 4,163,252
120 4,163,253
122 4,163,254
4,163,255
127 4,163,256
133 4,163,257
167 4,163,258
191 4,163,259
261 4,163,260

CLASS 360

13 4,163,261
14 4,163,262
4,163,263
68 4,163,264
77 4,163,265
84 4,163,266
102 4,163,267

CLASS 361

1 4,163,268
42 4,163,269
77 4,163,270
93 4,163,271
127 4,163,272
229 4,163,273
417 4,163,274

CLASS 362

80 4,163,275
255 4,163,276
263 4,163,277

CLASS 363

101 4,163,278

CLASS 364

105 4,163,279
200 4,163,280
4,163,281
431 4,163,282
439 4,163,283
474 4,163,284
710 4,163,285
719 4,163,286
757 4,163,287
900 4,163,288

CLASS 365

51 4,163,289
125 4,163,290
221 4,163,291

CLASS 366

83 4,162,854
213 4,162,856
261 4,162,857
273 4,162,875
274 4,162,855

CLASS 400

124 4,162,858

CLASS 403

75 4,162,859
199 4,162,860
242 4,162,861

CLASS 404

72 4,162,862

CLASS 405

45 4,162,863
75 4,162,864
154 4,162,865
277 4,162,866

CLASS 406

94 4,162,811

CLASS 408

157 4,162,867

CLASS 409

64 4,162,647

CLASS 414

9 4,162,868
27 4,162,734
70 4,162,869
78 4,162,733
107 4,162,870
376 4,162,871
514 4,162,735
713 4,162,872
718 4,162,873
736 4,162,732

CLASS 417

216 4,162,874
413 4,162,876

CLASS 422

36 4,163,038
56 4,163,039
131 4,163,040
179 4,163,041
4,163,042

CLASS 423

234 4,163,043
4,163,044
483 4,163,045
510 4,163,046
531 4,163,047

CLASS 424

45 4,163,048
59 4,163,049
115 4,163,050
124 4,163,051
200 4,163,052
230 4,163,053
244 4,163,054
267 4,163,055
272 4,163,057
273 R 4,163,058
277 4,163,059
278 4,163,060
279 4,163,061
324 4,163,056
4,163,062
330 4,163,063

CLASS 425

84 4,162,877
152 4,162,878
183 4,162,879
202 4,162,880
331 4,162,881
376 B 4,162,882
387.1 4,162,883
388 4,162,884
400 4,162,885
556 4,162,886

CLASS 426

2 4,163,064
94 4,163,065
99 4,163,066
538 4,163,068
573 4,163,067
582 4,163,069
642 4,163,070

CLASS 427

34 4,163,071
96 4,163,072
221 4,163,073
229 4,163,074

CLASS 428

328 4,163,075
339 4,163,076
355 4,163,077
373 4,163,078
411 4,163,079
424 4,163,080
429 4,163,081
447 4,163,082
472 4,163,083

CLASS 429

206 4,163,084

CLASS 431

28 4,162,887
76 4,162,889
265 4,162,888
351 4,162,890

CLASS 432

247 4,162,891

CLASS 435

7 B 4,162,895
17 4,162,942
23 4,162,941
75 4,162,938
119 4,162,940
254 4,162,939

CLASS 521

96 4,163,085
155 4,163,086
176 4,163,087

CLASS 525

3 4,163,100
5 4,163,031
53 4,163,033
74 4,163,032
429 4,163,030
433 4,163,088
449 4,163,029
531 4,163,097

CLASS 526

80 4,163,089
88 4,163,090
208 4,163,091
292 4,163,092

CLASS 528

45 4,163,094
67 4,163,095
69 4,163,096
99 4,163,098
172 4,163,099
301 4,163,093
347 4,163,101

CLASS 542

417 4,163,102
427 4,163,103

CLASS 544

160 4,163,104

CLASS 548

342 4,163,105

CLASS 560

11 4,163,106
61 4,163,107
121 4,163,108
4,163,110
122 4,163,109
4,163,111
132 4,163,112
185 4,163,113
186 4,163,114
240 4,163,115

CLASS 568

723 4,163,116

CLASS 585

481 4,163,028

CLASSIFICATION OF DESIGNS

D1—	16	252,476			252,486	D8—	80	252,495	D12—	9	252,505			252,516	D23—	3	252,524
	17	252,477			252,487		356	252,496		62	252,507		29	252,506		97	252,525
D3—	28	252,478		64	252,488	D9—	168	252,497		181	252,508	D16—	65	252,517			252,526
	68	252,479			252,489	D10—	15	252,498		209	252,509	D18—	14	252,518	D25—	11	252,527
	74	252,535		71	252,490			252,499	D13—	13	252,510		23	252,519	D28—	46	252,528
D6—	3	252,480		130	252,491		69	252,500	D14—	6	252,512	D19—	46	252,520		55	252,529
	24	252,481		234	252,483		73	252,501		13	252,511	D21—	27	252,530	D48—	3	252,531
	26	252,482	D7—	52	252,492		77	252,502		70	252,513		171	252,521			252,532
	59	252,485		94	252,493	D11—	134	252,503			252,514		177	252,522		23 R	252,533
	63	252,484		128	252,494		136	252,504	D15—	7	252,515	D22—	28	252,523		24 A	252,534

CLASSIFICATION OF PLANTS

P.—	51	4,444												

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

6 : 4,162,581
4,162,648
4,162,681
4,162,692
4,162,706
4,162,742
4,162,751
4,162,766
4,162,774
4,162,825
4,163,084
4,163,124
4,163,151
4,163,160
4,163,161
4,163,188
4,163,234
4,163,257
4,163,286
9 : 4,162,597
4,162,729
4,162,759
01 : 4,162,550
4,162,917
04 : 4,162,712
4,162,988
06 : Re.30,059
4,162,542
4,162,565
4,162,574
4,162,586
4,162,594
4,162,629
4,162,676
4,162,677
4,162,687
4,162,695
4,162,714
4,162,716
4,162,736
4,162,745
4,162,746
4,162,792
4,162,793
4,162,794
4,162,814
4,162,830
4,162,867
4,162,881
4,162,889
4,162,914
4,162,943
4,162,959

4,162,960
4,162,962
4,162,963
4,162,972
4,162,990
4,162,995
4,163,044
4,163,064
4,163,070
4,163,117
4,163,126
4,163,164
4,163,172
4,163,194
4,163,211
4,163,212
4,163,236
4,163,243
4,163,263
4,163,267
4,163,290
08 : 4,162,733
4,162,740
4,162,786
4,162,808
4,162,847
4,162,954
4,163,226
09 : 4,162,595
4,162,748
4,162,749
4,162,779
4,162,878
4,162,883
4,162,897
4,162,901
4,163,083
4,163,183
4,163,184
4,163,218
10 : 4,162,875
4,162,997
4,163,003
4,163,115
12 : 4,162,558
4,162,590
4,162,664
4,162,770
4,162,776
4,162,791
4,162,803
4,162,804
4,162,846

4,162,912
4,163,209
13 : 4,163,271
15 : 4,163,283
16 : 4,162,969
17 : Re.30,057
Re.30,061
4,162,549
4,162,554
4,162,557
4,162,560
4,162,569
4,162,570
4,162,580
4,162,591
4,162,638
4,162,650
4,162,655
4,162,673
4,162,688
4,162,693
4,162,728
4,162,764
4,162,797
4,162,857
4,162,872
4,162,873
4,162,882
4,162,929
4,162,966
4,162,973
4,162,974
4,163,004
4,163,112
4,163,123
4,163,145
4,163,154
4,163,259
4,163,269
4,163,273
4,163,274
18 : 4,162,588
4,162,780
4,162,871
4,162,910
4,163,025
4,163,071
4,163,116
4,163,128
4,163,137
4,163,138
4,163,174
19 : 4,162,567

4,162,796
4,163,010
4,163,063
20 : 4,162,671
4,162,685
4,162,753
4,163,058
21 : 4,162,566
4,162,571
4,162,621
4,162,904
22 : 4,162,614
4,162,625
4,162,691
4,162,704
4,162,705
4,163,205
24 : 4,162,610
4,162,641
4,162,645
4,162,701
4,162,761
4,162,806
4,162,926
4,163,092
4,163,135
4,163,190
4,163,198
25 : 4,162,651
4,162,690
4,162,727
4,162,732
4,162,818
4,162,829
4,162,831
4,162,833
4,162,834
4,162,836
4,162,892
4,162,932
4,163,134
4,163,176
4,163,222
4,163,231
26 : 4,162,555
4,162,579
4,162,582
4,162,596
4,162,631
4,162,632
4,162,683
4,162,755
4,162,801

4,162,802
4,162,824
4,162,842
4,162,853
4,162,870
4,163,005
4,163,026
4,163,081
4,163,082
4,163,086
4,163,090
4,163,104
4,163,105
4,163,107
4,163,110
27 : 4,162,605
4,162,630
4,162,660
4,162,711
4,162,809
4,162,856
4,162,906
4,162,976
4,163,065
4,163,127
4,163,132
4,163,147
28 : 4,162,547
29 : 4,162,992
31 : 4,162,682
4,163,143
33 : 4,162,765
4,163,192
34 : 4,162,689
4,162,719
4,162,730
4,162,731
4,162,757
4,162,879
4,162,891
4,162,913
4,162,920
4,162,955
4,162,975
4,162,994
4,163,016
4,163,021
4,163,022
4,163,028
4,163,031
4,163,035
4,163,053
4,163,057

4,163,067
4,163,068
4,163,102
4,163,142
4,163,155
4,163,158
4,163,221
4,163,225
4,163,237
4,163,239
4,163,252
4,163,255
4,163,262
35 : 4,162,684
36 : 4,162,553
4,162,563
4,162,622
4,162,623
4,162,659
4,162,680
4,162,718
4,162,754
4,162,788
4,162,799
4,162,826
4,162,828
4,162,832
4,162,844
4,162,845
4,162,848
4,162,918
4,162,933
4,162,938
4,162,967
4,162,980
4,162,981
4,163,006
4,163,015
4,163,030
4,163,033
4,163,037
4,163,050
4,163,069
4,163,073
4,163,120
4,163,199
4,163,200
4,163,227
4,163,229
4,163,233
4,163,235
4,163,238
4,163,244

	4,163,277		4,162,911		4,162,739		4,162,942		4,162,813		4,163,241
37	: 4,162,600		4,162,947		4,162,771		4,162,944		4,163,270		4,163,256
	4,162,607		4,162,983		4,162,823		4,162,961	48	: 4,162,575		4,163,289
	4,162,738		4,162,985	42	: Re.30,056		4,162,993		4,162,584	49	: 4,162,577
	4,162,815		4,162,986		Re.30,060		4,163,054		4,162,619	51	: 4,162,633
	4,163,089		4,162,987		4,162,544		4,163,072		4,162,635		4,162,743
38	: 4,162,708		4,163,001		4,162,564		4,163,079		4,162,713		4,162,811
39	: 4,162,546		4,163,008		4,162,572		4,163,131		4,162,763	53	: 4,162,587
	4,162,601		4,163,094		4,162,573		4,163,133		4,162,777		4,162,735
	4,162,656		4,163,165		4,162,626		4,163,139		4,162,781		4,162,859
	4,162,686		4,163,216		4,162,640		4,163,152		4,162,782		4,163,275
	4,162,709		4,163,240		4,162,643		4,163,167		4,162,838	54	: 4,162,907
	4,162,726	40	: 4,162,694		4,162,654		4,163,180		4,162,868		4,163,029
	4,162,789		4,162,956		4,162,707		4,163,208		4,162,894		4,163,113
	4,162,800		4,162,957		4,162,725		4,163,220		4,162,900		4,163,114
	4,162,817		4,162,958		4,162,760		4,163,232		4,162,931	55	: 4,162,741
	4,162,850		4,162,964		4,162,767	44	: 4,163,125		4,162,989		4,162,798
	4,162,874		4,162,965		4,162,778	45	: 4,162,752		4,163,019		4,162,982
	4,162,880		4,163,011		4,162,785	46	: 4,162,783		4,163,066		4,163,136
	4,162,886		4,163,014		4,162,821		4,162,968		4,163,186		4,163,254
	4,162,898	41	: 4,162,589		4,162,855	47	: 4,162,593		4,163,206		
	4,162,909		4,162,710		4,162,928		4,162,646		4,163,228	56	: 4,162,862

DESIGN PATENTS

6	: 252,531		252,515		252,529	28	: 252,500		252,535		252,490
	252,532		252,516	12	: 252,521	29	: 252,527	37	: 252,484	39	: 252,476
	252,533		252,522	19	: 252,478	33	: 252,519		252,485		252,477
05	: 252,507		252,528	25	: 252,525	36	: 252,480		252,486		252,492
06	: 252,481	09	: 252,493	26	: 252,482		252,483		252,487		252,523
	252,496		252,502	27	: 252,479		252,509		252,488	48	: 252,503
	252,504		252,508		252,511		252,526		252,489	53	: 252,506
	252,510		252,517		252,530						

PLANT PATENTS

41	: 4,444				

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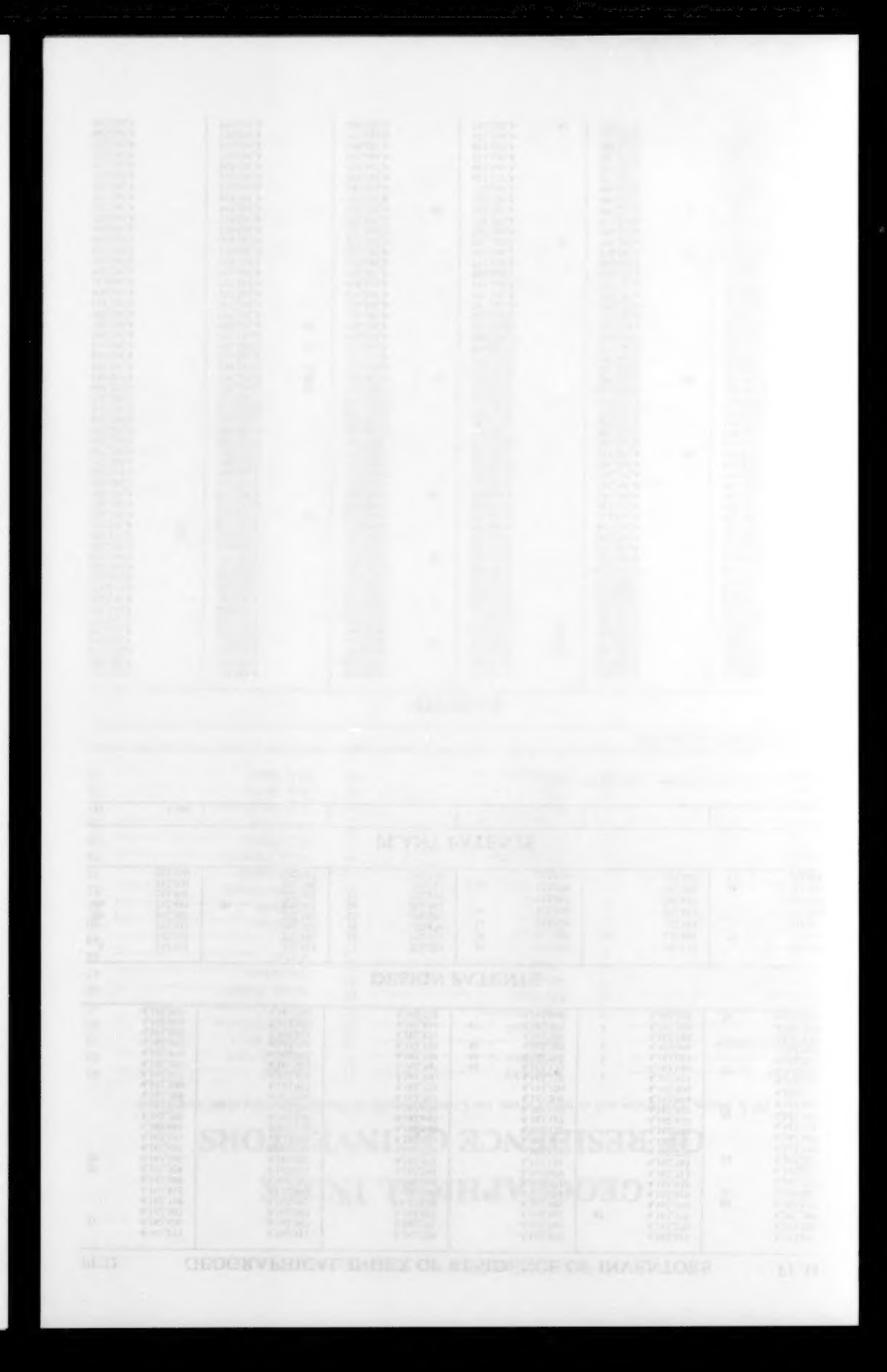

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